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HANDBOOK FOR ACTION OFFICERS AND TRAINING
DEVELOPERS FOR NEW MATERIEL SYSTEMS

SYSTEMS MANNING TECHNICAL AREA

August 1981

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FOREWORD

The Life Cycle System Management Model (LCSMM) for Army Systems (DA Pamphlet 11-25) outlines an orderly series of steps that must be accomplished by those organizations involved in the development of new Army materiel systems. TRADOC Regulation 600-4, Integrated Personnel Support (IPS) describes the responsibilities of the US Army Training and Doctrine Command for integrating personnel and training considerations into the development effort for new materiel systems. This handbook provides guidance to TRADOC System Managers (TSMs) and training system action officers (AOs) on the sources of information and procedures necessary to accomplish IPS activities in coordination with the LCSMM sequence of events.

The handbook is designed to be used as both a guidance and reference document. It identifies the major sources of information needed for key IPS activities/events and describes in detail the procedures for accomplishing these events. The handbook addresses the need for ensuring that training and personnel requirements are developed and fully integrated, early and continuously, throughout the development cycle for new materiel systems. This effort is responsive to requirements of Army Project 2Q262722A791, Manpower, Personnel and Training.


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SECTION I

INTRODUCTION

Purpose

The purpose of the present handbook is to provide guidance on the training development requirements that must be met during materiel acquisition. This guidance is provided for the TRADOC System Managers (TSMs) and system action officers (AOs) to assist them in their responsibilities for coordinating each event and for the action officers in training developments to assist in the actual execution of the events as prescribed by DA Pamphlet 11-25, Life Cycle System Management Model for Army Systems.

TRADOC Regulation 600-4, Integrated Personnel Support (IPS), describes the responsibilities of the U.S. Training and Doctrine Command for developing training and personnel subsystems for selected materiel systems. TRADOC is responsible for ensuring that training and personnel requirements are developed and fully integrated, early and continuously, throughout the development cycle for new materiel systems. TRADOC Regulation 600-4 contains brief descriptions of each of the key IPS actions and events that must be accomplished during each phase of the Life Cycle System Management Model (LCSMM) for new materiel. The present handbook identifies the major sources of information needed for these key IPS actions/events, and specifies how to access that information. The present handbook also describes in some detail, the procedures for accomplishing these key IPS events and relates them to the Life Cycle System Management Model (DA Pamphlet 11-25). Each of the events described must be accomplished for each materiel system, both major and non-major. For most major systems a TRADOC System Manager (TSM) will be responsible for coordinating the events within TRADOC and interfacing with the PM. For the other major systems and all non-major systems, an Action Officer, usually from combat developments, will be

assigned this responsibility. Throughout this handbook, he will be referred to as the system AO. The actual accomplishment of the events -- writing the report, gathering the data, developing the methodology, etc. -- may be performed at the TSM/system AO level or tasked to another organization depending upon the event, the regulations governing it, and the expertise needed to accomplish the task. The individuals receiving such tasking, such as training developers, will be referred to as Action Officers (AOs). An Action Officer is the individual tasked with the actual accomplishment of the event. The system AO is TRADOC's representative for that system unless that system has a TSM.

Training requirements during Phase I, The Conceptual Phase, of the LCSMM receive special emphasis in this handbook because prompt and comprehensive performance in these early stages provides the basis for all later work. The steps that should be taken to meet these requirements are described in considerable detail.

Scope

The IPS (Integrated Personnel Support) model is designed to support the development of training and personnel subsystems for new materiel systems. Therefore, this model must be closely coordinated with the Life Cycle System Management Model as described in DA Pamphlet 11-25. Toward this end, both models have been subdivided into the same four phases: the Conceptual Phase, the Demonstration and Validation Phase, the Full-Scale Engineering Development Phase, and the Production and Deployment Phase.

During each of these phases, those responsible for developing the training and personnel subsystems must ensure that certain actions are taken. These actions are displayed in Figures 1 through 4 of TRADOC Regulation 600-4, and are reproduced in Section II of this handbook as Figures II-3 through II-6.

Each IPS action or event shown in Figures II-3 through II-6 is described in this handbook. The following information is provided:

- a. The required inputs or data base for each event.
- b. The general procedures for obtaining input data and information.
- c. The procedures for accomplishing the event.
- d. Event outputs or products and their use relative to other IPS events.
- e. The relationship between the event, the IPS model, and the LCSMM.

Throughout this handbook emphasis is placed on identifying sources of information and data. Wherever possible, the handbook also lists reference material to which the reader can turn for additional information.

For many IPS model events, suitable sources of information and/or fully developed procedures for accomplishing the event could not be located during the compilation of this handbook. Such information gaps were identified as "technological gaps" and are the subject of a separate report.

It should be noted that new techniques and procedures were not developed for this handbook. Rather, the handbook assembles and organizes the available information, from a wide range of references, about various procedures that can be followed to accomplish IPS events.

Organization of Handbook

This handbook is designed to be used as both a guidance and a reference document. It is purposely redundant; it supplies the user with the information he needs for a particular event or activity.

Section III through VI of the handbook describe the training and personnel requirements that must be met during LCSMM Phase I through IV respectively. Each LCSMM phase is subdivided into the major events or actions that must occur within that phase. An event may involve such activities as preparing requirements documents, collecting information, evaluating the products of earlier events, coordinating draft documents, etc.

The events identified and described in this handbook relate directly to the events of the Integrated Personnel Support (IPS) model as set forth in TRADOC Regulation 600-4. A few events have been subdivided to allow for more detailed discussion of activities. As noted already, training-related events that occur during Phase I of the LCSMM are described in particular detail.

The handbook is organized so that the Action Officer or TSM having questions about a particular event can go directly to the description of that event and determine:

- a. Purpose of the event
- b. Relation of the event to other LCSMM/IPS events
- c. Action Officer/TSM responsibilities
- d. Event phasing
- e. Procedures for accomplishing the event
- f. Input data requirements and source(s) of data
- g. Event output requirements
- h. Reference to related regulations and sources of procedural guidance
- i. Examples, as appropriate

The events are presented in diagrammatic form in Section II as Figures II-3 through II-6. Larger, fold-out versions of these figures are located at the back of the handbook. The fold-out figures contain a page reference in this handbook for each event.

The appendixes of the handbook are a glossary of terms, a list of abbreviations and acronyms, and a consolidated list of military and technical references.

Preparatory Readings

Newly assigned Action Officers may not be familiar with the process by which new materiel systems are developed. If so, it is recommended that you read the material listed below. Collectively, these readings will provide you, in a short time, with good background on the development of new hardware systems and their training and personnel subsystems.

- a. This handbook, Section I and Section II. This will introduce you to the materiel acquisition process.
- b. Army Regulation 1000-1, Basic Policies for System Acquisition by the Department of the Army
- c. DA Pamphlet 11-25, Life Cycle System Management Model for Army Systems
- d. TRADOC Regulation 600-4, Integrated Personnel Support (IPS)
- e. Army Regulation 71-9, Materiel Objectives and Requirements
- f. TRADOC Pamphlet 71-21, Combat Development Staff Officer's Handbook
- g. TRADOC Circular 70-80-1
- h. If available:
 - (1) DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook
 - (2) ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems
 - (3) ARI Research Product, Manpower Personnel and Training Requirements for Materiel System Acquisition.

Background

The process by which Army materiel systems are initiated, developed, validated, deployed, and supported is described in the Life Cycle System Management Model (LCSMM). That model outlines the general procedures for developing and acquiring Army systems, from inception through disposal.

In the past, training and personnel requirements have not been given enough consideration during the early development of new systems. As a consequence, fielding an adequately manned new system sometimes has been delayed. Increases in the sophistication of weapon systems, along with potential decreases in the number and skill level of future operator and maintenance personnel, promise to make this problem more serious. In addition, the Department of Defense and the Department of the Army are shortening the development cycle of many systems; some cycles have been halved.

For these reasons, training and personnel requirements must be considered early in the LCSMM if fully qualified operator and maintenance personnel are to be available by the time the materiel system can be operational. To implement early development of the training subsystem and to increase the responsiveness of the training proponent for a system, the position of TRADOC System Manager (TSM) was established.

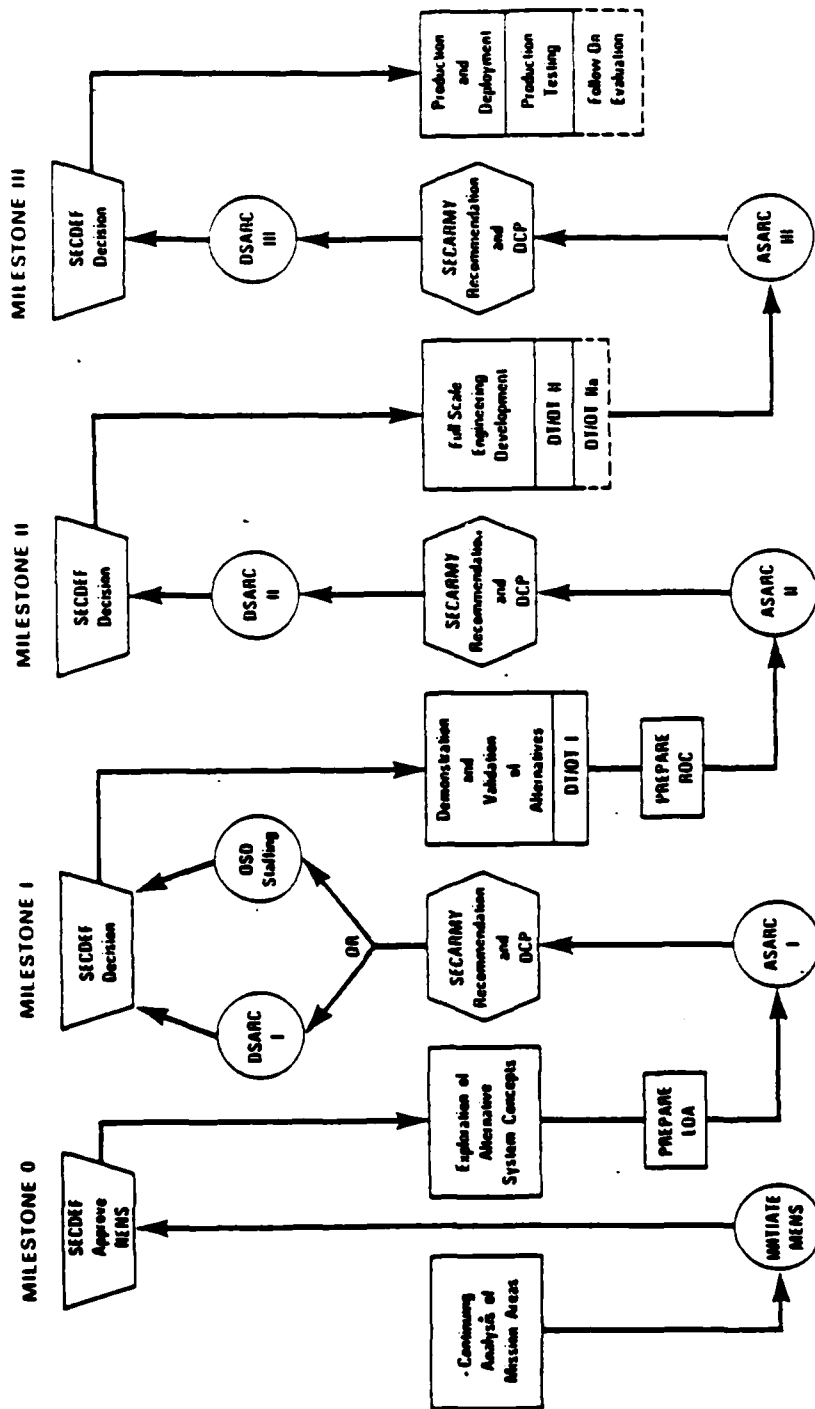
A TSM is the TRADOC representative for a particular system. He is not a doer -- he is an energizer, organizer, integrator, and expeditor. He ensures that all user activities needed to support development of a system are started in a timely fashion and integrated into the materiel development process. The TSM is the counterpart of the Project Manager (PM) from the U.S. Army Development and Readiness Command (DARCOM) and is responsible for providing all user input for his system to the PM.

TSMs are designated for DA major materiel systems and selected non-major systems (AR 71-9). In addition, Action Officers (AO) are designated to represent TRADOC for all other non-major materiel systems under development by the Army. Both TSMs and AOs reside at a proponent school and are responsible for managing the development of the training subsystem. Essentially, AOs are responsible for the same training and personnel actions and events as TSMs.

Typical of the TSM/AO responsibilities are planning for training, personnel, logistics, and testing; acting as the user representative during interactions with the DARCOM Project Manager; preparing TRADOC positions and presentations for materiel acquisition decision reviews (IPR/ASARC/DSARC); and taking part in the PM contractual actions to ensure that the training system being developed is compatible with user requirements.

The IPS events described in this handbook directly relate to LCSMM activities. Many IPS events cannot begin until certain LCSMM events have been accomplished; the outputs of most IPS events are inputs to critical LCSMM events. Therefore, both the DARCOM PM and the TRADOC TSM must understand the relationships between the two sets of events. This handbook describes these relationships.

Regulations exist that establish policies, general procedures, and responsibilities for both the LCSMM and the IPS model events. For a few of these events, DA or TRADOC pamphlets have been prepared describing in more detail how to accomplish that event. However, for most IPS events procedures have not been fully formulated and in numerous cases still await development. This handbook provides tentative procedures that can be followed while the process of establishing detailed procedures continues.



ASARC Army System Acquisition Review Council
 DSARC Defense System Acquisition Review Council
 DT/OT Development Test/Operational Test
 LOA Letter of Agreement
 MENS Mission Element Needs Statement
 ROC Required Operational Capability

Figure I-1. Materiel Acquisition Process for Major Systems (from AR 1000-1)

SECTION II

MATERIEL ACQUISITION MANAGEMENT MODELS

Life Cycle System Management Model (LCSMM)

The process by which the Army acquires materiel systems is governed by the Army's Life Cycle System Management Model (LCSMM). The sequence of the events are further described in TRADOC Pamphlet 71-12, which provides an overview of the four phases of the LCSMM. Some of the key features of the LCSMM are shown in Figures II-1 (from AR 1000-1) and II-2. The four phases can be summarized as follows.

PHASES OF THE LCSMM

CONCEPTUAL PHASE (PHASE I)

During this phase, alternative concepts for obtaining a desired operational capability are examined. These initial investigations identify (a) the basic nature and characteristics of the proposed system(s) and (b) further issues in need of examination. During the remainder of the Conceptual Phase, the concept(s) for one or more alternative systems is further refined, analyzed, and compared.

The results of these studies are incorporated into a Concept Formulation Package (CFP). The CFP forms the basis for the development of an Outline Acquisition Plan (OAP) describing proposed procedures for acquiring the proposed system(s). The OAP contains a description of estimated training and personnel requirements for the proposed system. These estimates are prepared under the direction of the training proponent (usually TRADOC).

DEMONSTRATION AND VALIDATION PHASE (PHASE II)

During this phase, advanced development prototypes of the proposed system(s) are developed, usually under contract. The design features and operational utility of the prototypes are then assessed in a series of tests. On the basis of the test findings, the Concept Formulation Package (CFP) that was developed during the conceptual Phase is refined.

If the Developmental Test (DT I) and Operational Test (OT I) are reasonably successful, the system design is further refined to reflect the latest thinking on how the system is to be employed. The refined system design is incorporated into a Required Operational Capability (ROC) document, and a plan for acquiring an advanced Engineering Development Prototype is prepared. A decision is then made to continue or not to continue materiel development.

FULL-SCALE ENGINEERING DEVELOPMENT PHASE (PHASE III)

During this phase, an advanced design of the materiel system is developed and tested. Also, all support subsystems (training, personnel, and logistics) are developed and tested. Following these steps, the system Acquisition Plan is updated. A decision is then made on whether the system is suitable for deployment; an affirmative decision leads to award of a production contract.

PRODUCTION AND DEPLOYMENT PHASE (PHASE IV)

During this phase, operational units are trained, system deficiencies identified in testing are corrected, equipment is procured and distributed, and logistic support is provided. Follow-On Evaluations (FOE) may occur once the new system becomes operational.

THE SYSTEM ACQUISITION CYCLE

As implied in Figures II-1 and II-2, a decision to enter the next phase of the LCSMM model for a materiel system is based on a review of:

- a. The adequacy of the design, development, and testing activities accomplished to date, along with a review of conclusions derived from those activities. This information is contained in key supporting documents prepared prior to review milestones.
- b. The continued existence of the threat or other conditions/operational deficiencies that led to initiation of the project.

As the materiel acquisition process continues the materiel concept progresses through the following stages: (1) from a general to a specific concept (Conceptual Phase); (2) from a specific concept to validated prototype hardware (Validation Phase); (3) from prototype hardware to improved materiel that has received a full-scale test (Full-Scale Development Phase); and (4) from fully tested materiel to operational equipment (Production and Deployment Phase). While this process is underway, plans for obtaining skilled personnel develop from general concepts into specific and validated training programs and associated training devices. The goal of the LCSMM, and of the IPS model to be discussed next, is to have a fully developed and validated training program in place by the time the materiel is ready for operational use.

As noted in AR 71-9, Chapters 3 and 4, the decision to start development of a new materiel system under guidance of the LCSMM is based on the approval of a Mission Element Needs Statement (MENS). A MENS identifies and supports the need for a new or improved mission capability. The preparation of a MENS is based on the continuing assessment of the need for new materiel, based both on perceived future threats and on the desire to take advantage of advances in new technology. Approval of a MENS occurs at Milestone 0 in the LCSMM (see Figure II-1).

The preparation of a MEIS, and the research and analysis upon which it is based, can be viewed as a preliminary phase to the four phases of the LCSMM. This phase, known as Mission Areas Analysis (MAA), occurs on a continuing basis. In AR 71-9 it is discussed in Chapter 3 under the heading, Initiation of Potential Materiel System.

Integrated Personnel Support (IPS) Model

Integrated Logistic Support (ILS), AR 700-127, is the process by which the Army obtains reliable, maintainable, transportable, and supportable equipment at the lowest cost of ownership. While the materiel acquisition process is underway, the Army must develop, acquire, test, and deploy the required support resources for the new materiel system. Such resources, collectively referred to as the "system support," include support and test equipment, skilled personnel (including the training programs and training devices needed to develop operator, crew, and maintenance skills), supply support, technical logistical data, and facilities. The process for acquiring skilled personnel and the necessary attendant training programs is described by the Integrated Personnel Support (IPS) model, TRADOC Regulation 600-4.

IPS events and activities are accomplished by TRADOC. They must be carefully coordinated with the materiel development events that are the responsibility of the DARCOM Project Manager of the system. They also must be coordinated with the Deputy Chief of Staff for Personnel (DCSPER). One way of describing this coordination is in terms of the key documents that must be produced during each phase of the materiel development process. Most of these key documents must address both training and personnel issues. It is the responsibility of a TSM or the designated systems Action Officer (AO) to assure that these issues are addressed for the system, that the results are incorporated

into appropriate documents, and that a time schedule is agreed upon by the system PM and TSM/AO is followed:

As an illustration of this integrated process:

- o During the Conceptual Phase of the LCSMM, two key supporting documents must be produced -- the Letter of Agreement (LOA) and the Outline Acquisition Plan (OAP).

The LOA is jointly prepared by the combat developer (TRADOC) and the materiel developer (DARCOM). The TSM/AO prepares one section of the LOA identifying critical people-related issues that should be explored further. These issues relate to three general areas -- personnel investigations, training requirements, and personnel requirements.

- o After the LOA is approved, the TSM/AO guides the development of preliminary training plans and the examination of personnel and training requirements. In later activities, plans for training and for obtaining skilled personnel are tested and refined.
- o Alternative training approaches may be considered during Phase I. The cost and effectiveness of these alternatives are examined in specific studies, and the findings are incorporated into the Concept Formulation Package (CFP). The CFP is a key element of the OAP (Outline Acquisition Plan).
- o During Phase I, the training subsystem developer (training proponent) identifies the critical training issues. Also, the training developer, in cooperation with the Soldier Support Center, identifies the critical personnel needs that should be explored. Following LOA approval, the first examination of these issues begins.
- o At the same time that training is being planned, draft plans for obtaining skilled personnel are developed. The materiel developer prepares the Tentative Qualitative and Quantitative Personnel Requirements Information (TQQPRI), and the TSM/AO is responsible for the tasking and coordination of the preparation of input to the TQQPRI and the Outline Individual and Collective Training Plan (OICTP).
- o Toward the end of Phase I, DARCOM will identify a Best Technical Approach (BTA), describing the materiel and operational characteristics of the proposed hardware concept selected for further development. The TSM/AO uses BTA information to refine existing training plan outlines (the OICTP).

The development of a training system is based on repeated consideration of a variety of factors. All of these factors can be covered under three terms -- "personnel investigations," "training requirements," and "personnel requirements." These terms are discussed in TRADOC Regulation 600-4 and DA Pamphlet 11-25, and in later portions of this handbook.

As the materiel system progresses through its developmental cycle, its design configuration becomes more stable and definitive, and more detailed information becomes available about the system and its operational employment. As this occurs, the training developer can become more precise about personnel requirements, individual and collective training plans, necessary training materials and devices, and procedures for validating training materials and devices.

The procedures by which training systems are developed are described in such documents as the Army's Instructional System Development (ISD) manuals, Military Standards for the preparation of Skill Performance Aids (SPA), the joint DARCOM/TRADOC Technical Documentation and Training Acquisition Handbook, and TRADOC Cir 70-80-1. The procedures described in these documents can be readily applied in existing materiel systems because data from such systems are available. The process for adapting these procedures to materiel systems under development has not been described in detail, although a general overview of the process is available in some of the documents that describe ISD procedures.

The process for adapting ISD procedures to systems under development is based on what is known as "comparability analysis." Comparability Analysis involves analyzing proposed materiel in terms of its similarity to existing materiel. The objective is to identify subsystems and functions of a proposed system that appear to be identical or quite similar to existing systems. For those portions judged to be similar, historical and organizational data from the existing system are used to make initial training-related decisions about that portion of the new system. Those portions of the new system that are, or seem to be, different from existing systems are initially analyzed by a group of training and materiel development experts (Subject Matter Experts -SMEs). This

group attempts to determine if the "new" portions of a proposed system impose special requirements on the training system. For example, if new skills are required, will special training devices be necessary?

During the Conceptual Phase, plans and recommendations regarding training are based both on historical data obtained from similar systems and on information developed on the basis of professional judgment. After prototype equipment is developed during Phase II, and especially after the Operational Testing of the prototype (OT I), more task-analytic data will be available to replace those developed earlier on the basis of professional judgment.

These task-analytic data will be refined further after an analysis of Engineering Development prototype materiel and the operational test of that materiel (OT II). Thus, as the training system is developed, the data base for the system will progress from a mixture of data based on historical records and professional judgment to data derived from the new materiel system. Concurrently, the data base will become more detailed and valid.

Relation of LCSMM and IPS Models

The major IPS model events that occur during each of the four phases of the LCSMM are shown in Figure II-3, II-4, II-5, and II-6, respectively. The number in () above and to the right of most blocks [(1), (2), (3), etc.] refer to numbered LCSMM event blocks as presented in DA Pamphlet 11-25. The alphanumeric codes above and to the left of many blocks (A1, A9, etc.) are key events in the IPS model. The training developer provides critical inputs to these events and the TSM/AO usually is responsible for preparing a portion of the required document. Most key events in the IPS model also are key events in the LCSMM.

The block diagrams presented in Figure II-3 through II-6 vary somewhat from those in TRADOC Reg. 600-4. This is because this handbook emphasizes the training related events, and those events have been expanded beyond the level of detail provided in TRADOC Reg. 600-4. Additionally some of the events, such as

A7 and A7.1, have been combined in one discussion, because the development of one of the events was so related to the development of the other that separate discussions were confusing.

Most events shown in Figures II-3 through II-6 are the responsibility of either the combat developer or the training developer. The actual conduct of training-related events occurs at the TRADOC school selected as the proponent for the new system.

Throughout this handbook the interrelation between the LCSMM and IPS models will be noted. IPS-related activities are initiated by one or more LCSMM events and depend on LCSMM events for critical inputs, especially information derived from prototype equipment. All requirements and most supporting documents produced during the LCSMM process must address personnel and training issues and are, therefore, dependent on inputs from IPS events.

In the following sections of this handbook, the IPS events are described. Special attention is given to the procedures for accomplishing the events and identifying the responsibilities of TSM and/or AOs designated for the developing systems. The fold-out charts for the four Phases, in the back of the handbook, should be consulted while the event descriptions are being read.

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Figure 11-4. Demonstration and Validation (DUAL) Phase, LCSMM

Full-Scale Engineering Development, Phase III

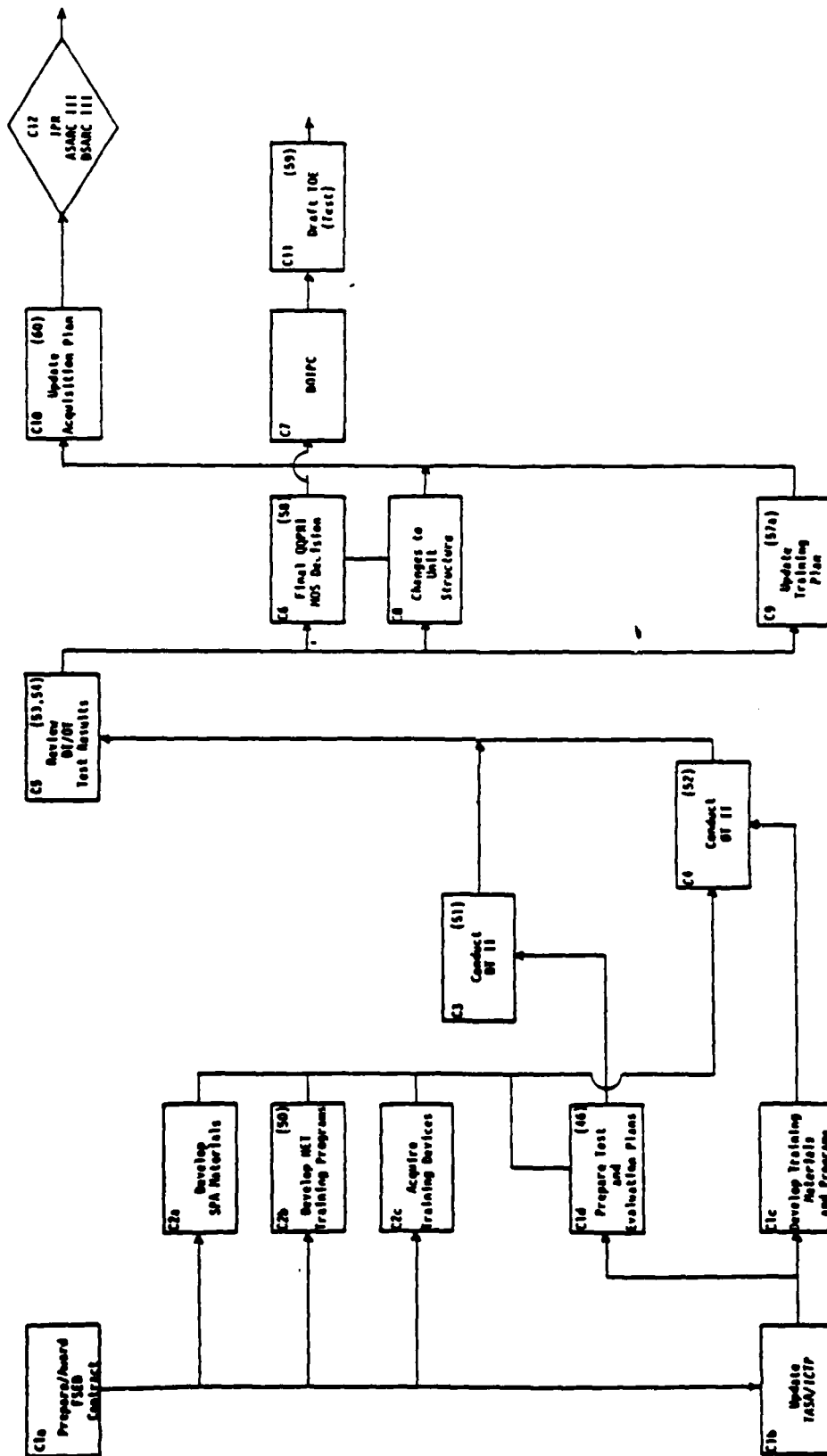
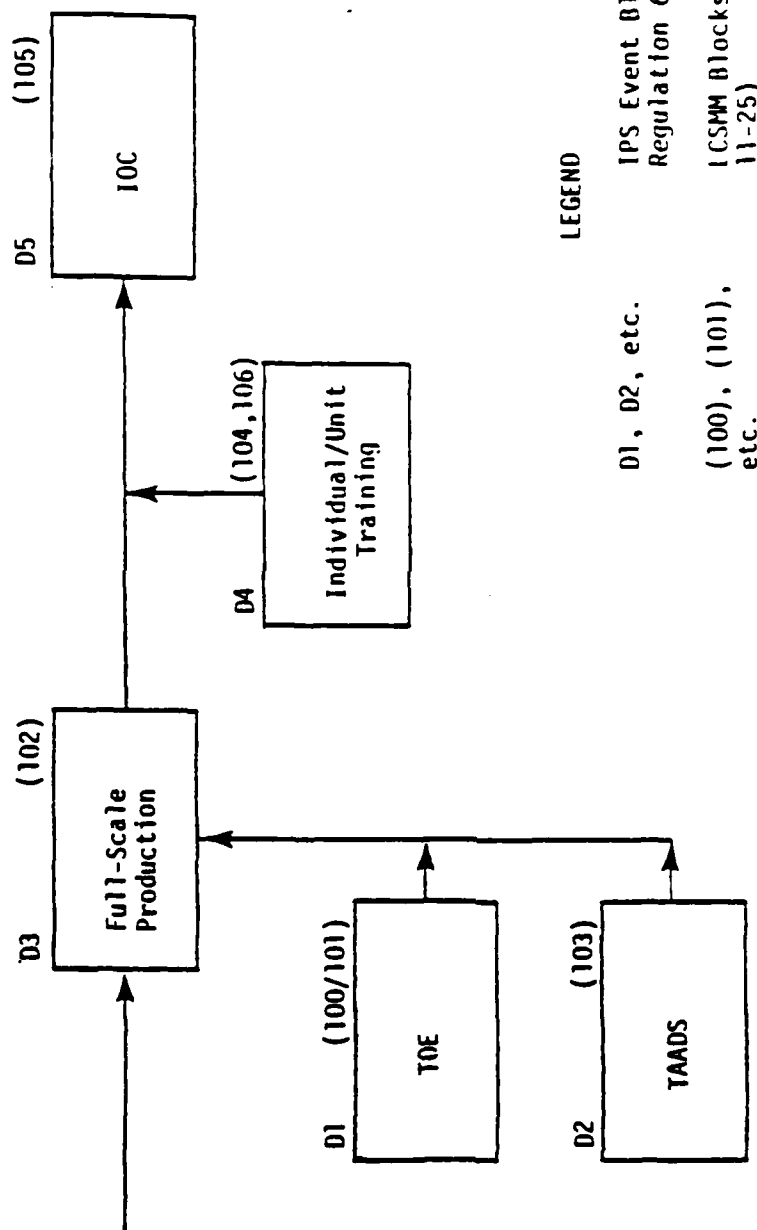


Figure II-5. Full-Scale Engineering Development (FSED) Phase, LCSNM

PRODUCTION AND DEPLOYMENT PHASE IV



LEGEND

- D1, D2, etc. IPS Event Blocks (TRADOC Regulation 600-4)
- (100), (101), etc. LCSMM Blocks (DA Pamphlet 11-25)

Figure II-6. Flow Diagram of Major Events, Phase IV

SECTION III

LCSNM MODEL: CONCEPTUAL PHASE

Overview

The primary training activities during the Conceptual Phase (Phase I) are:

- o Evaluate the proposed materiel system concept in terms of training implications.
- o Establish a preferred training concept.
- o Develop training-related data, in sufficient detail to support training requirements, planning, and decisions on initiating training programs.

During this phase the training, the developer prepares portions of and provides inputs to three required documents; the Letter of Agreement (LOA), the Concept Formulation Package (CFP), and the Outline Acquisition Plan (OAP). In addition, other important supporting documents require TRADOC inputs, e.g. Organization and Operational Concepts and the Cost and Operations Effectiveness Analysis, (COEA). As part of the materiel concept investigation process, the training developer makes a gross estimate of the training requirements and identifies critical issues that should be examined during CFP preparation. This information is incorporated into the LOA.

For major systems, after the LOA has been approved, a Special Task Force (STF) or Special Study Group (SSG) may be formed to study the alternative conceptual approaches and issues noted in the LOA. A TRADOC TSM/AO will be a member of this group. For non-major systems a STF/SSG may not be formed, but a TRADOC Action Officer will be designated.

For both major and minor systems the TSM/AO has management responsibility for drawing up a draft training plan and for making an initial estimate of the plan's cost and effectiveness. The actual development of the training plan should be accomplished by the AO in Training Developments who has been designated for that system. In addition, he may be asked to assist the combat developer in formulating the organizational and operational concepts for the proposed system. Information about these concepts, plus an outline of a plan

to support the training plan (training support plan), and a preliminary estimate of cost and training effectiveness (CTEA), provide inputs to the major studies that must be performed as part of developing the CFP (Concept Formulation Package, Event A9).

The initial investigation of training and personnel requirements may have identified critical issues in need of exploration (e.g., Are two- or three-person crews needed?). In addition, a standard set of personnel issues must be studied for each new material system (e.g., What are the entry requirements for crew personnel? How many persons, by MOS and skill level, will be needed?). The results of these studies provide the basis for the personnel and training portion of the OAP (Outline Acquisition Plan, Event A10).

It should be noted that during the Conceptual Phase more than one materiel concept may be explored. The training developer must identify special training problems, prepare a training plan, and conduct a cost and training effectiveness analysis (CTEA) for each materiel concept.

Also, for any particular materiel concept two or more approaches to obtaining skilled personnel may first appear to be equally cost-effective but this should be verified at least in general terms.

Scope

Section III contains information on each of the 12 major events of the IPS model that must be accomplished during Phase I of the LCSMM. These events are depicted in Figure II-3 and in the Phase I chart in the back of this handbook. For each event the following information is provided:

- a. Purpose of event
- b. Relation to other LCSMM/IPS events
- c. TSM/AO responsibilities
- d. Event phasing
- e. General procedures for accomplishing event

- f. Input data or event data base, along with information about data sources, when data are available, and how to obtain data
- g. Event outputs and end products, including information about format requirements and the use of outputs
- h. References, including technical "how to do it" information
- i. Examples of outputs, when available

Five Phase I events specifically related to training are discussed in considerable detail. These events, as discussed in TRADOC Reg. 600-4 are:

- o Event A3 -- Training Requirements
- o Event A5 -- Letter of Agreement (LOA)
- o Event A6 -- Task Listing
- o Event A7 -- Training Support Plan
- o Event A7.1 -- Draft ICTP (Individual and Collective Training Plan)

In this Handbook, events 7 and 7.1 are discussed under one event, Event A7.

Each of these events is divided into its major elements and sub-elements, and step-by-step procedures are provided for doing each sub-element. These procedures describe the steps AOs should take to assure accomplishment of the event or one of its sub-elements. Many of the activities described requires assistance from subject-matter-experts (SME).

Standard Reference and How-To-Do-It Documents

Several how-to-do-it documents will be referred to frequently in describing training-related activities. SMEs selected to assist the AO will use these documents. The TSM/AO should obtain a copy of these references. They are:

- a. TRADOC Circular 351-4, Job and Task Analysis
- b. TRADOC Circular 351-8, Individual and Collective Training Plan Developing Systems: Policies and Procedures
- c. TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development (5 Vols.)
- d. TRADOC Pamphlet 351-4, Job and Task Analysis Handbook

Discussion of Events

EVENTS A1, A2 -- MATERIEL CONCEPT INVESTIGATION (A1), PERSONNEL INVESTIGATIONS (A2)

OVERVIEW

Purpose

During the Materiel Concept Investigation (A1) the materiel developer examines various ways of meeting the requirements contained in a Mission Element Needs Statement (MENS). From these studies will emerge one or more materiel concepts, along with concepts of how each would be operationally employed, manned, and supported.

While the materiel developer is formulating these materiel concepts (A1), the TRADOC proponent examines, for each materiel concept, the feasibility of obtaining the needed manpower (A2), the qualifications of persons required to man the proposed system (A4), and the training requirements (A3). Events A2, A3, and A4 collectively result in preparation of a personnel and training concept. Products of these events form the basis for the training plan and the list of training and personnel issues that must be described in the LOA (Letter of Agreement, Event A5).

During the Conceptual Phase the training proponent must work with very incomplete and sketchy data. Thus, the plans formulated during Event A2, Personnel Investigations, are essentially gross estimates that must be validated later. The primary goal of Event A2 is to identify the personnel needs for the proposed system, and the critical personnel issues that should be examined further. Other A2 goals include assessing the potential impact of the personnel requirements of the system on the Army's current and projected force structure. Any constraints on the numbers and/or types of personnel for the new system should be identified during Event A2. These constraints may already be described in the system's MENS.

Relation to Other LCSMM/IPS Events

When possible, the A2 event and its companion investigations, Training Requirements (A3) and Personnel Requirements (A4), should be performed in conjunction with the Materiel Concept Investigation (A1). In practice, activities in A2, A3, and A4 are not apt to begin until some time after the Materiel Concept Investigation is underway. These three events usually begin after the materiel concept has been described in enough detail to provide usable input data.

On the Phase I chart, the output of the Personnel Investigations (A2) is shown feeding into Training Requirements (A3). In practice, Events A2, A3, and A4 all employ a similar data base and may be performed concurrently by the same persons. Thus, considerable exchange of information usually occurs among these three events. In fact, the initial identification of mission critical/high risk training tasks is accomplished during Event A3, and it is appropriate to accomplish this portion of Event A3 before beginning Event A2.

The findings and issues developed during these events eventually will be incorporated into the Letter of Agreement (A5). Before proceeding with Events A2 and A3, the training developer should find out what types of personnel and training-related information must go into the LOA (see format for LOA, Event A5).

TSM/AO Responsibilities

The TSM/AO, in coordination with the Soldier Support Center, should identify the personnel issues to investigate during Event A2. He should consult MILPERCEN for information about the types and numbers of new recruits that may be available to man the system. He should also consult (a) other TSM/AOs at the proponent school and (b) the Systems Affordability, Analysis and Review Team, DCSPER to determine whether other proposed systems will be competing for the same types of personnel.

Phasing

Event A2 can begin concurrently with the beginning of the Materiel Concept Investigation (A1). However, it is likely to begin some time later on, when more information will be available. The personnel investigations should be completed and all critical issues identified by the time the LOA preparation begins.

INPUT DATA/DATA BASE FOR EVENT A2

Mission Element Needs Statement (MENS)

A Mission Element Needs Statement (MENS) identifies and supports the need for a new or improved mission capability, described in terms of the operational tasks to be accomplished. Information contained, and of interest to the training developer, includes: identification of the mission areas and mission elements to be performed; statement of the deficiency addressed by the MENS; known constraints that apply to any acceptable solution; and plans to explore solutions to the deficiency, to include establishment of a TRADOC TSM office after the program is initiated (Milestone 0). The MENS can be obtained from DARCOM or TRADOC. It should be immediately available since it is the document that describes the need for the materiel concept under investigation.

Science and Technology Objectives Guide (STOG)

The Science and Technology Objective Guide (STOG) defines (a) the capability required to meet a perceived threat or (b) a deficiency that can be corrected by improved technology. STOG provides the baseline from which system and subsystem developments are begun. You can obtain the STOG from HQTRADOC, ATCD-SM. It should be immediately available.

Materiel Concept Descriptions

For each materiel concept seriously considered during the Materiel Concept Investigation (A1), the materiel developer will prepare a description of the support concept, human functions, operational environment, and any known

constraints. This information forms the basis for the functional and comparability analyses conducted by the training developer. These analyses provide the data the developer needs to make initial estimates about personnel and training requirements.

Materiel Concept Descriptions can be obtained from persons/agencies responsible for preparing the materiel concept. Usually this source is DARCOM. The descriptions should be available about midway through the Materiel Concept Investigation. Refinements may continue right up to preparation of the LOA. If possible, the training developer should work closely and continuously with the materiel and combat developer in order to have immediate and ready access to these descriptions. If this is not possible, the training developer should schedule a series of meetings to review written documentation, as well as recent ideas.

Mission Profile

This profile describes the operational requirement(s) that a system must meet to accomplish a particular mission or set of missions. It includes the expected mix of ways in which the new system will be used in carrying out its operational role, and the expected percentages of time that it will be exposed to various types of environmental conditions.

A mission profile must be included in the LOA, but it may not be in final form before LOA preparation begins. Since the training developer needs this profile some months earlier, the combat developer should try, if at all possible, to produce a tentative profile for the training developer's use. The Mission Profile should be requested from the combat developer.

Data From Similar Systems

These data can provide a basis for making initial estimates of personnel and training requirements. In particular, they can be used to identify potential problems in obtaining various types of personnel or to identify problems related to training. These data should be immediately available. They can be obtained from study of related Tables of Organization and Equipment (TOEs), Programs of Instruction (POIs), Soldier's Manuals (SMs), and Army Test and Evaluation Programs (ARTEPs). These documents are located at the proponent schools.

Future Plans for Recruitment, Force Structure, and Manpower

This information can be used to estimate the feasibility of obtaining certain types of persons in certain numbers by some future date. It provides a basis for estimating constraints on obtaining personnel, and the degree of competition for similar persons by different materiel systems. You should be able to obtain the data on an "as needed" basis from the Soldier Support Center Affordability Team, ODCSPER. In cooperation with the combat and training developers, you should formulate questions on the availability of various types of persons by number. Request MILPERCEN or the Soldier Support Center, as appropriate, to develop answers to these questions.

Professional Judgment of Subject Matter Experts (SMEs)

Certain portions of a proposed new system will be judged to be quite different from existing systems. In such cases historical or organizational data cannot be used to estimate personnel requirements. For those portions of the new system, the materiel and combat developers, along with training developers, will have to make "best guesses" as to personnel requirements. This should be done by subject matter experts -- persons familiar with the new system concept and/or systems of the same general type. These estimates should be developed after the materiel concept has been described in some detail, but before preparation of the LOA.

OUTPUTS AND END PRODUCTS FOR EVENT A2

The output of Event A2 is a paper, incorporating discussions with appropriate SMEs, that (a) outlines the personnel/manning concept for the proposed system and (b) lists the personnel issues that need further investigation. This paper should be attached as an annex to the Letter of Agreement (Event A5), and the contents of the paper and the issues for further study should be summarized in Paragraph 5 of the LOA. For information on format, see AR 71-9 and the discussion of the LOA (Event A5, page III-66) contained in this handbook.

REFERENCES

- AR 10-38, U.S. Army Concepts Analysis Agency
- AR 71-5, Introduction of New or Modified Systems/Equipment (to be replaced by AR 350-135)
- AR 71-9, Materiel Objectives and Requirements
- AR 310-49, The Army Authorization Documents System (TAADS)
- TRADOC Regulation 700-1, Integrated Logistic Support
- DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook
- MITRE Corporation, A Guide for TRADOC System Managers
- ARI-TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems
- ARI Research Product, Manpower Personnel and Training Requirements for Material System Acquisition
- ARI Research Product 81-13 through 81-18, Job Aids: The Instructional Systems Developments Model
- Goclowski, J. C. et al., Integration and Application of Human Resource Technologies in Weapon System Design: Coordination of Five Human Resource Technologies, AFHRL-TR-78-6(I)

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A2

As the Materiel Concept Investigation proceeds, the material developer and the combat developer, working jointly, will consider various concepts. They will translate the most promising into system descriptions, dealing with what

the system is to accomplish and who or what will perform various system functions. Eventually, they will accept one or two concepts for further investigation, and will prepare a system description and a mission profile for each concept. The profile "consists of a list of 'tasks and conditions' for system employment in military operations" and will be included in the LOA (Event 5) as Annex A. Based on the system description and mission profile(s), a description of the proposed system's characteristics, support concepts, and possible constraints will be prepared by the combat developers for each concept.

About half way through the material concept process, enough information should be available so that the training developer can begin to identify training considerations. This should be done in concert with representatives of the Soldier Support Center and MILPERCEN.

No procedures have been established for identifying personnel and training requirements at the time of Materiel Concept Investigation. However, many developers follow a course of action based on two general procedures, functional analysis and comparability analysis.

Personnel and training decisions ought to be based on a job/task analysis. It may seem that this would be impossible during the conceptual phase of the LCSMM, but it can be done. An examination of the operational concept and a preliminary version of the mission profile for a proposed system will indicate (a) the major subsystems of the proposed system and (b) the role of operator and maintenance personnel with respect to these subsystems. Even at this early stage a matrix can be developed that describes, for each subsystem, the functions of system operators and maintenance personnel.

At this point, the "performance requirements" or functions of the human components of the systems need be stated only in general terms (e.g., acquire targets or perform direct support maintenance on engine). Further analysis of the proposed operational environment should identify major factors that might

affect desired performance (e.g., excessive heat, vibration, noise, or stress due to workload or enemy attack). After this functional analysis matrix is developed, the combat and materiel developers should, on the basis of professional judgment, collectively identify those human functions that seem most critical to mission accomplishment. Subsequent analyses should concentrate on these functions.

With rare exceptions, new systems replace existing systems and are similar in many ways to those they are to replace. For this reason the initial analysis of a new system can be based in part on a comparability analysis. This type of analysis identifies the subsystems and components of a new system that are the same as, or similar to, those of a somewhat comparable system. Often this is the system that the developing system is to replace.

A comparability analysis (see Event A3 for a more detailed discussion) begins by examining each subsystem of a proposed system to determine whether it is (a) conceptually similar to an existing system and/or (b) physically and functionally similar to an existing subsystem. To the extent that the new and existing systems have similar subsystems, historical data can be used to identify personnel and training requirements.

While subsystems of a proposed system may be conceptually similar to those of present systems, the proposed human functions of these subsystems may be different. For example, the materiel concept might involve using a remotely operated tank instead of one operated by a driver, or a proposed new radar might use built-in test equipment rather than direct support maintenance personnel. Thus, the comparability analysis involves identifying whether, for similar subsystems, the manner in which they will be operated and maintained is or is not to be changed.

Six important questions should be addressed during the Personnel Investigations (Appendix A, TRADOC Regulation 600-4):

- a. Can it reasonably be assumed that soldiers with the required mental and physical skills will be recruited and made available to operate and maintain the proposed system?
- b. Will current or future manpower authorization support the system?
- c. What will be the impact on the Army's current and projected personnel structure?
- d. Will personnel trade-offs be required? What will be the effect on proposed system objectives?
- e. What is the human resources development impact of the proposed system?
- f. What cost-effective trade-offs are possible to capitalize on the human resources aspects for the system instead of materiel aspects?

Information bearing on these questions, plus any others that seem important, should be identified in cooperation with MILPERCEN and Soldier Support Center personnel. These are the questions that must be examined during later portions of Phase I of the LCSMM. Also, these questions must be addressed both in the Letter of Agreement (Event A5) and in the Outline Acquisition Plan (Event A10). For each personnel-related question a tentative answer should be developed. The data for this step will come from SSC in the form of recruitment plans, projections of the force structure, and projections of available manpower.

During the Materiel Concept Investigation, it will not be possible to identify personnel requirements precisely. However, it should be possible to specify the range of options to consider. As an example, for a proposed system, an analysis of the mission profile and the system concept should provide some estimate of officer and EM requirements. To the extent possible, these estimates should be based on comparing the proposed system with existing and comparable systems.

The general personnel requirement options to consider are (a) the same numbers and types of personnel, (b) greater or smaller numbers of the same types of personnel, and (c) greater or smaller numbers of different types of personnel. Of these three options the most reasonable one(s) should be examined in more detail.

Once identified, the options can be studied in conjunction with MILPERCEN and Soldier Support Center to identify those that are feasible in terms of future recruitment plans and manpower authorization and applicable to the future free structure.

EVENT A3 -- TRAINING REQUIREMENTS

OVERVIEW

Purpose

The Training Requirements event, and Events A2 and A4 dealing with personnel, collectively result in preparation of training and personnel concepts and a preliminary draft of a training development model. The products of these three events form the basis for the training plan and the list of training and personnel issues that must be included in the Letter of Agreement (LOA). TRADOC Regulation 600-4 suggests that Event A3 begins with a rough task and skill analysis.

Relation to Other LCSMM/IPS Events

This event is one of three interrelated events conducted by TRADOC personnel during the Materiel Concept Investigation. The results of Event A3 form the basis for certain sections of the LOA. Therefore, before proceeding with event activities, the training developer should study the LOA format to identify training topics that must be addressed in that document (see Letter of Agreement, Event A5).

In practice, Events A2, A3 and A4 are so closely intertwined that they must make use of the same data base. Therefore, the functional and task analysis activities described in this handbook under Event A3 provide part of the data base for Events A2 and A4. During Event A3, it is important to identify a possible requirement for training devices, embedded training, or the need to study any other special training problems. The product of this event, a preliminary training plan, will continually be updated, critically examined, and validated throughout the LCSMM. Although constrained by the lack of detailed data, the proposed training plan and the listing of training issues needing further study should be as comprehensive as possible.

TSM/AO Responsibilities

Training concept development will be assigned to a proponent school; a training AO will be assigned for a specific system. This AO has the responsibility for (a) overseeing the development of the training concept; (b) coordinating training concept development with other interested schools; (c) coordinating development activities with all interested directorates of the proponent school, with support system organizations (Personnel, Logistics, Administration), and with the materiel developer (usually the PM).

At this stage, the TSM or system AO should establish a working committee on task analysis. Included on this committee should be the designated representative for this system from training development, representatives from the appropriate academic department, and the Soldier Support Center, and a technical expert on the system, if needed, from either DARCOM or the manufacturer(s).

The designated AO from training developments, as a member of the working committee on task analysis, is responsible for the initiation of a training concept for individual training for each postulated system. He will be assisted by the working committee in accomplishing the activities required by this event.

Phasing

This event can begin soon after initiation of Event A1, Materiel Concept Investigation. It should be completed in time for end products to be incorporated into the LOA.

INPUT DATA/EVENT DATA BASE

- a. Same as described for Event A2, Personnel Investigations (see p. III-4 through III-13).
- b. Outline of duty positions and personnel requirements as developed during Event A2, Personnel Investigations.

OUTPUTS AND END PRODUCTS FOR EVENT A3

- a. A series of tables that collectively summarize:
 - (1) Individual training requirements for each proposed operator and maintenance position.
 - (2) Individual training device requirements for operator and maintenance positions.
 - (3) Individual institutional training requirements for operator and maintenance positions.
- b. A summary of collective training requirements for operator and maintenance positions.
- c. A summary of the functional requirements for embedded testing/embedded training. May be omitted when not applicable.

REFERENCES

AR 602-1, Human Factors Engineering Program
TRADOC Regulation 351-3, Resident Training Policy
TRADOC Circular 351-4, Job and Task Analysis
TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development
DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook

DETAILED PROCEDURES FOR ACCOMPLISHING EVENT A3

Event A3 can be divided into 11 elements, as shown in Figure III-1. Each of these elements can be divided into subelements of procedural steps. Table III-1 lists all the elements and procedural steps for accomplishing Event A3. Each step is described in detail on the following pages.

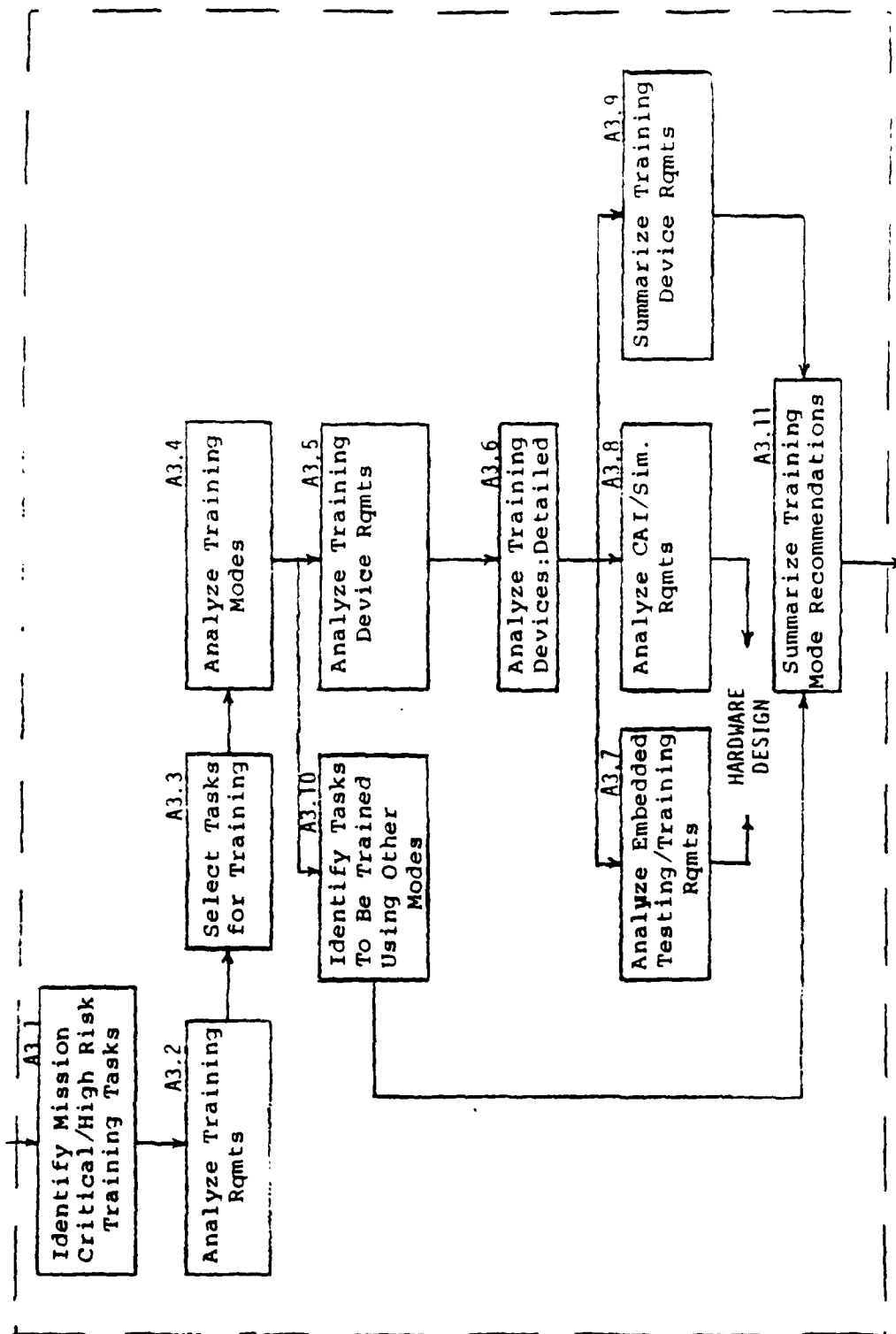


Figure III-1. Functional Block Diagram of Event A3. Training Requirements Analysis

A3.1 Identify Mission Critical/High Risk Training Tasks

OVERVIEW

PURPOSE. During this activity a preliminary list of operator and maintenance duties is compiled. At this stage in the LCSM it is seldom possible to identify specific task requirements, but it is possible to identify the duty area for which operator and maintenance personnel will be responsible. The combat developer will identify a list of duty or subject areas that are critical for mission accomplishment. The training developer will prepare a list of duties that are or may be difficult to teach. These two lists, when combined, become a list of "mission critical/high risk training tasks." During Phase I of the LCSM the development of plans for training tasks on this list is emphasized.

Table III-1

ELEMENTS AND PROCEDURAL STEPS OF EVENT A3,
TRAINING REQUIREMENTS

A3.1 IDENTIFY MISSION CRITICAL/HIGH RISK TRAINING TASKS

- 3.1.1 Gather Input Data
- 3.1.2 Refine/Update Data
- 3.1.3 Compare New and To-Be-Replaced Systems
- 3.1.4 Identify System Components
- 3.1.5 Identify Operator Requirements
- 3.1.6 Identify Maintenance Requirements
- 3.1.7 Identify Mission Critical/High Risk Training Tasks
- 3.1.8 Review Task Listings
- 3.1.9 Revise Task Listings

A3.2 ANALYZE TRAINING REQUIREMENTS

- 3.2.1 Categorize Operator Tasks
- 3.2.2 Categorize Maintenance Tasks

A3.3 SELECT TASKS FOR TRAINING

- 3.3.1 Develop Task Selection Criteria: Operator Tasks
- 3.3.2 Develop Task Selection Criteria: Maintenance Tasks
- 3.3.3 Make Preliminary Selection of Operator Tasks
- 3.3.4 Make Preliminary Selection of Maintenance Tasks
- 3.3.5 Review and Revise Tasks Selected for Training

A3.4 ANALYZE TRAINING MODES

- 3.4.1 Identify Training Modes for Operator Tasks
- 3.4.2 Judge Adequacy of Current Training
- 3.4.3 Identify Training Problems/Possible Solutions
- 3.4.4 Select Training Mode
- 3.4.5 Identify Training Modes for Maintenance Tasks
- 3.4.6 Judge Adequacy of Current Training
- 3.4.7 Identify Training Problems/Possible Solutions
- 3.4.8 Select Training Mode

A3.5 ANALYZE TRAINING DEVICE REQUIREMENTS

- 3.5.1 Collect Data on Presently Taught Operator Tasks
- 3.5.2 Evaluate Effectiveness of Current Devices
- 3.5.3 Evaluate Need for Training Devices
- 3.5.4 Analyze New Operator Duties/Tasks
- 3.5.5 Collect Data on Presently Taught Maintenance Tasks
- 3.5.6 Evaluate Effectiveness of Current Devices
- 3.5.7 Evaluate Need for Training Devices
- 3.5.8 Analyze New Maintenance Duties/Tasks

- A3.6 ANALYZE TRAINING DEVICES: DETAILED
 - 3.6.1 Analyze Training Device Requirements: Operator Tasks
 - 3.6.2 Identify Training Device Preferences: Operator Tasks
 - 3.6.3 Analyze Training Device Requirements: Maintenance Tasks
 - 3.6.4 Identify Training Device Preferences: Maintenance Tasks
- A3.7 ANALYZE REQUIREMENTS FOR EMBEDDED TESTING/TRAINING
 - 3.7.1 Gather Background Information
 - 3.7.2 Determine Feasibility of Using Computer for ET
 - 3.7.3 Decide Type of ET to Recommend
 - 3.7.4 Determine CMI Functional Requirements
 - 3.7.5 Review CMI Functional Requirements With Materiel Developer
 - 3.7.6 Prepare Justification Document for CMI
- A3.8 ANALYZE CAI/SIMULATION REQUIREMENTS
 - 3.8.1 Develop Functional Requirements for CAI
 - 3.8.2 Develop Functional Requirements for Simulation
 - 3.8.3 Review Requirements With Materiel Developer
 - 3.8.4 Prepare Justification Document
- A3.9 SUMMARIZE TRAINING DEVICE REQUIREMENTS
 - 3.9.1 Summarize Requirements for Operator Training
 - 3.9.2 Summarize Requirements for Maintenance Training
- A3.10 IDENTIFY TASKS TO BE TRAINED USING OTHER MODES
 - 3.10.1 Become Familiar With SPAS Program
 - 3.10.2 Review Training Mode Choices for Non-Resident Training:
Operator Tasks
 - 3.10.3 Identify/Analyze Collective Training Tasks: Operator Tasks
 - 3.10.4 Identify Collective Training Tasks: Maintenance Tasks
- A3.11 SUMMARIZE TRAINING MODE RECOMMENDATIONS
 - 3.11.1 Summarize Training Requirements for Operator Training
 - 3.11.2 Summarize Training Requirements for Maintenance Training
 - 3.11.3 Summarize Training Requirements for Collective Operator Tasks
 - 3.11.4 Summarize Training Requirements for Collective Maintenance Tasks

TSM/AO RESPONSIBILITIES. The TSM/AO is responsible for aggregates and coordinating all training developer and combat developer activities for this event. The Directorate of Training Development (DTD) has final responsibility for identifying high risk training tasks. The combat developer is responsible for identifying mission critical tasks. The materiel developer should review and agree to both sets of tasks, but especially mission critical tasks. Most Event A3 activities should be performed by a small committee consisting of representatives from the Directorate of Combat Development (DCD), the Directorate of Training Development (DTD), and a Subject Matter Expert (SME) from the appropriate Academic Department.

Sources of Assistance. An individual from within the appropriate academic department of the proponent school should be designated as the point of contact for information about the new system under consideration. At each of the school directorates there should also be a person responsible for maintaining familiarity with the developing system. Information about the system can also be obtained from the materiel developer. Other sources include those persons who were involved in preparing the Mission Element Needs Statement (MENS) for the system.

PROCEDURES

A3.1.1 GATHER INPUT DATA. The purpose of this activity is to gather all available information about the developing system. Some of the information needed will be incomplete and/or vague, or may not have been developed yet. The TSM/AO should maintain an updated file of available information. Also, in the absence of the TSM, recent information about the system can be obtained from the Combat Developments Directorate (DCD) of the proponent school. If the information is not available within your school, contact the DARCOM Project Manager office. You should collect the following information and documents:

- a. Mission Element Needs Statement (MENS).
- b. List of functional requirements for the system. May be attached to MENS.
- c. List of estimated system capabilities. May be attached to MENS.
- d. Mission Area Analysis Report. A description of the tactical use of the system, to include environmental conditions of use.
- e. Identification of the most comparable existing system(s). Obtain from DCD or from the DARCOM PM.
- f. Technical manuals for most comparable system(s).
- g. Other data/information, as available:
 - (1) Statement of training policy
 - (2) Statement of maintenance policy
 - (3) Function Allocation Analysis Report
 - (4) Proposed staffing: operators and mechanics
 - (5) List of mission critical functions/duties/tasks

A3.1.2 REFINE/UPDATE DATA. The data collected on the developing system may be out of date. Contact the DARCOM PM and the DCD representatives for the new system and find out whether your information is up-to-date. If it is not, arrange for a conference to get the most recent information. Attending should be a DARCOM representative, a DCD representative, a person representing the proponent school's Training Development Directorate (DTD), and the TSM/AO. During the conference, review and update, as needed, information about:

- a. Functional requirements of the system
- b. Estimated capabilities of the system
- c. Functions to be performed by operators and by maintenance personnel (Function Allocation Analysis Report)
- d. Any decisions on training and maintenance policy

If more than one system configuration or manning concept is still being considered, update information for each concept.

3.1.3 COMPARE NEW AND TO-BE-REPLACED SYSTEM. Most new systems are developed as replacements for existing systems. Throughout Phase I, the training proponent must compare the developing system with the to-be-replaced system, in order to judge the impact of the new system on present training programs. To accomplish this the AO must acquire a good understanding of the major differences between the two systems.

In cooperation with the working committee on task analysis review the major differences between the developing system and its existing counterpart.

Identify:

- a. Differences in functional requirements/capabilities, such as:
 - (1) Speed: 25 vs. 50 mph
 - (2) Maneuverability
 - (3) Target detection capabilities
 - (4) Target engagement capabilities: Stationary vs. moving gun platform
 - (5) Other important differences
- b. Differences in function allocation (job duties)
 - (1) Operator positions
 - (2) Maintenance positions

A3.1.4 IDENTIFY SYSTEM COMPONENTS. During this activity the AO in cooperation with the working committee on task analysis identifies the major hardware similarities and differences between the new and the to-be-replaced system. Use this information to make judgements about training requirements for the new system. Follow these steps:

- a. Analyze existing (comparable) system.
 - (1) Gather operator and maintenance TMs for system.
 - (2) Identify major subsystems (e.g., hull, turret components, armament). Follow breakout contained in TM.

- (3) Subdivide major subsystems into major components (e.g., tank hull = driver's compartment, engine compartment, air cleaners, tracks, suspension). Follow TM breakout.
- (4) Subdivide each major component into its major assemblies of equipment groups. Follow TM breakout.
- (5) Record subsystem, component, and assembly titles on Form A3.1.4 (Figure III-2). Assign alphanumeric number to designate the specific assembly (e.g., A.1.1).

b. Compare hardware configurations.

- (1) For each assembly/equipment group recorded on Form A3.1.4, check whether that assembly is identical to, somewhat similar to, dissimilar from or absent from the new system.
- (2) Revise list by deleting all assembly/equipment groups that are absent from new system.
- (3) Add to the above list all new subsystems/components/assemblies planned for the new system. Add new components under the appropriate subsystem. Add new assemblies under the appropriate component. On Form A3.1.4 note that these subsystems/components/assemblies are absent from the old system.

c. Arrange review by materiel developer.

If Steps "a" and "b" above are not done in cooperation with a representative of the materiel developer, the resulting list of subsystems/components/assemblies should be reviewed and amended by the materiel developer.

A3.1.5 IDENTIFY OPERATOR REQUIREMENTS. Using Form A3.1.5 (Figure III-3), answer the questions listed below for each assembly listed on Form A3.1.4. Note that the information in the first four columns from the left on Form A3.1.4 is used again in the first three columns of Form A3.1.5. Answering these questions develops the information and/or judgments needed to identify mission critical/high risk training tasks.

IDENTIFICATION OF SYSTEM COMPONENTS AND ASSEMBLIES

Date _____
AO _____
(name) _____
(phone) _____

Name of Comparable System M-60 Name of Developing System XM-1 Tank

<u>Subsystem Name</u>	<u>Major Component Name</u>	<u>Major Assembly Name</u>	<u>Reference No.</u>	<u>Similarity Between New and Old System</u> <u>Identical</u> <u>Somewhat</u> <u>Dissimilar</u> <u>Absent</u> <u>Similar</u>
Hull	Driver's compartment Engine compartment Air cleaners		A.1.1	

1. At the end of this list, add all subsystems/components/assemblies that are in the developing system but not the comparable system.
2. The first 4 columns of this form are duplicated on Forms A3.1.5, A3.1.6, A3.1.7a and A3.1.7b. The "cut and paste" method can be used to reproduce information in these 4 columns.

Figure III-2. Form A3.1.4, Identification of System Components and Assemblies

Date _____
 AO _____
 (name) _____
 (phone) _____

IDENTIFICATION OF OPERATOR REQUIREMENTS

Name of Comparable system M-60 Name of Developing System XM-1 Tank

<u>Subsystem and Major Component Names</u>	<u>Assembly Name</u>	<u>Reference No.</u>	<u>OP RQMT NO YES</u>	<u>RQMT STM.</u>	<u>Special Conditions/Standards</u>
<u>HULL</u> Driver's compartment		A.1.1	(A) — 1 —	(B) 2	(C) Operate over rougher, steeper terrain and at greater speeds; turbine vs combustion engine

Figure III-3. Form A3.1.5, Identification of Operator Requirements

- a. Does assembly have controls, readouts, etc., that must be manipulated or monitored by an operator? Mark NO or YES under Column A (Operator Requirement). If YES, record whether operator requirement is performed: primarily by an individual (1); two or more members of a crew (2); both, depending on circumstances (3); or unknown at this time (4).
- b. Are operator requirements substantially the same as, or different from, those for a comparable system? In Column B, (Requirement Similarity), record identical (1); somewhat similar (2); different (3); or unknown at this time (4).
- c. Are there any special on-the-job conditions/requirements/standards that must be met by operator(s)? In Column C, note anything that makes the operator task unusual or especially difficult, critical, dangerous, etc.

A3.1.6 IDENTIFY MAINTENANCE REQUIREMENTS. Using Form A3.1.6 (Figure III-4), record initial judgments about maintenance requirements. The left-hand entries on this form are identical to those for Form A3.1.4. Before completing Form A3.1.6, check with the materiel developer and/or DCD to determine whether a maintenance policy has been established for the new system. This policy may affect judgments about maintenance requirements. For each listed assembly:

- a. In Column A, note who has responsibility for preventive and simple corrective maintenance. Record: unit operator (1); unit mechanic (2); maintenance battalion technician (3); other (4).
- b. In Column B, record who has responsibility for direct support maintenance: unit technician (1); maintenance battalion (2); general support/depot/contractor (3); other (maintenance contact teams, etc.) (4).
- c. In Column C, for maintenance tasks performed within unit, note whether the task will be performed by an individual (1) or requires a team (2).
- d. In Column D, (Requirement Similarity), note whether the maintenance requirements are: substantially the same (identical) (1); somewhat similar (2); different from those for the comparison system (3); or unknown at this time (4).
- e. In Column E, record any special job conditions/requirements/standards that may make the task unusual, difficult, dangerous, etc.

Date _____
 AO _____
 (name) _____
 (phone) _____

IDENTIFICATION OF MAINTENANCE REQUIREMENTS

Name of Comparable System _____ Name of Developing System _____

<u>Subsystem and Major Component Names</u>	<u>Assembly Name</u>	<u>Reference No.</u>	<u>Maint. Respon.</u>			<u>RQMT SIM.</u>	<u>Comments/Notes</u>
			(A)	(B)	(C)	(D)	(E)

Figure III-4. Form A3.1.6, Identification of Maintenance Requirements

The judgments made during activities A3.1.5 and A3.1.6 can be made collectively by representatives of DCD, DTD, and the academic department of the proposed school. DCD has final responsibility for identifying and/or verifying crew-performed tasks. The requirements identified during activities A3.1.5 and A3.1.6 should be reviewed by the materiel developer.

A3.1.7 IDENTIFY MISSION CRITICAL/HIGH RISK TRAINING TASKS. The foregoing activities will provide enough familiarity with the job requirements for the proposed system so that fairly valid judgments can be made about the importance of the major duties of each job position. Before doing this, determine whether any guidance exists for selecting tasks for training. Contact your school commandant and/or persons within the DCD to obtain this information. Usually, training tasks are selected in accordance with criteria contained in TRADOC Pamphlet 350-30, Vol. I (Analyze), pp. 114-155. Read these pages if you are not already familiar with them.

For systems under development, the most important factors to consider (unless you have other instructions) are as follows:

- a. Task Learning Difficulty--the time, effort, and assistance necessary to achieve performance proficiency.
- b. Probability of Deficient Performance--the known probability of deficient performance on similar equipment.
- c. Task Delay Tolerance--a measure of how much delay can be tolerated between the time the need for the task performance becomes evident and the time actual performance must begin.
- d. Probable Consequence of Inadequate Performance (on mission accomplishment)--consequences in terms of loss of life, personnel injury, equipment damage, degraded operational performance, combat effectiveness, etc.

Selection factors of less importance include: (1) percent of persons performing task; (2) time spent performing task; (3) frequency of performance; and (4) time between job entry and task performance.

It is recommended that initial selection of mission critical/high risk training tasks be based on the first four factors listed above. Using Form A3.1.7a (Figure III-5), rate operator tasks in terms of Task Learning Difficulty (Col. A), Probability of Deficient Performance (Col. B), Task Delay Tolerance (Col. C), and Probable Consequence of Inadequate Performance (Col. E). Use a five-point rating scale with the points on the scale defined as follows:

1. Extremely high
2. Moderately high
3. Average
4. Moderately low
5. Extremely low

NOTE: Reverse the above scale points for Task Delay Tolerance (e.g., from 1 = extremely short time can be tolerated to 5 = extremely long time can be tolerated).

The foregoing judgments should be made by the working committee on task analysis composed of persons from DTD, DCD, the appropriate Academic Department, and other SMEs as appropriate. In particular, DCD should approve judgments made about Probable Consequence of Inadequate Performance because these judgments directly relate to mission criticality. Also, a representative of the materiel developer should review and concur with the judgments.

Using a set of A3.1.7b forms (Figure III-6), repeat the above procedures for maintenance tasks. Unless instructed otherwise, analysis of maintenance requirements for duties performed at the level of general support/depot/contractor need not be undertaken at this time.

A3.1.8 REVIEW TASK LISTINGS. During this step, interested parties should be given an opportunity to review and to add to or delete from task listings. Lists should be reviewed by:

Date _____
 AO _____

 (name)

 (phone)

IDENTIFICATION OF MISSION CRITICAL/HIGH RISK TRAINING TASKS: OPERATOR TASKS

Name of Comparable System _____ Name of Developing System _____

Subassembly and Major Component Names	Assembly Name	Ref. No.	Task Ratings			Sum of Ratings	Rating	Oper. ID	Cut/H.R. Tasks	OT I Tasks
			Learn. Diff.	Defic. Perform.	Delay Tol.					
			(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)

1. Do not record judgments about maintenance tasks on this form.

Figure III-5. Form A3.1.1.7a, Identification of Mission Critical/High Risk Training Tasks: Operator Tasks

Date _____
 AO _____
 (name) _____
 (phone) _____

IDENTIFICATION OF MISSION CRITICAL/HIGH RISK TRAINING TASKS: MAINTENANCE TASKS

Name of Comparable System _____ Name of Developing System _____

Subsystem and Major Component Names	Assembly Name	Ref. No.	Task Ratings			Sum of Ratings	Ratings Inadeq. Perf.	MNTN. ID	Crit./ H.R. Tasks	OT I Tasks
			Learn. Diff.	Defic. Perform.	Delay Tol.					
			(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)

1. Do not record judgments for operator tasks on this form.

Figure III-6. Form A3.1.7b, Identification of Mission Critical/High Risk Training Tasks: Maintenance Tasks

- a. Combat Development Directorate--If a representative from DCD was initially involved in preparing the list, he should submit the draft list to his directorate for concurrence. Especially, DCD should review judgments about mission criticality and about crew operator or maintenance requirements.

NOTE: Operator task listings may not include all important operator-like tasks that occur in a tactical environment. DCD will review operator tasks and add crew/unit tasks, especially those that might be covered on an ARTEP (Army Test and Evaluation Program).

- b. Materiel Developer--Concurrence should be obtained. Materiel developer and TRADOC must agree on high risk tasks that will be taught prior to and during Operational Test I.
- c. Training Development Directorate--In most schools this directorate has final responsibility for identifying critical tasks.

A3.1.9 REVISE TASK LISTINGS. On the basis of reviewer comments, AO from training developments should develop a revised list of tasks. When possible, this should be done with the same group that developed the original list.

An overall rating is then developed for representing high risk learning tasks by summing the ratings for Learning Difficulty, Probability of Deficient Performance, and Task Delay Tolerance. The sum is recorded in Column D (Sum of Ratings) on Form A3.1.7a and A3.1.7b.

A3.2 Analyze Training Requirements

OVERVIEW

PURPOSE. During this activity the inventories of operator and maintenance duties/tasks developed during Event A3.1 are sorted by duty position (e.g., driver, gunner, loader, tank commander, "to be determined"). The inventories should further be divided into individually performed tasks, collective or crew-performed tasks, and "to be determined" tasks.

TSM/AO RESPONSIBILITIES. The TSM/AO for the systems coordinates activities of representatives from the working committee on task analysis and forwards the product of activity to PM for review.

SOURCES OF ASSISTANCE. Representatives from DCD and DTD, Subject Matter Expert from the academic department, and materiel developer representative.

PROCEDURES

A3.2.1 CATEGORIZE OPERATOR TASKS. Using Form A3.1.7a, categorize all operator tasks.

- a. Identify the title of all operator positions under consideration. Include any officer positions that will be involved with system operation (e.g., tank driver, tank commander).
- b. Record title of each operator position on back of Form A3.1.7a and assign an identification number (e.g., O-1, O-2).
- c. In Column F (Operator ID) of Form A3.1.7a, record judgment as to which operator is primarily responsible for each operator task. For example:

Task A.1.1.1 O-1

Task A.1.1.2 O-1/O-2 (Operator 1 or Operator 2 depending on situation)

Task A.1.1.3 C (Requires coordination of two or more crew members)

Task A.1.1.3 TBD (To be determined)

A3.2.2 CATEGORIZE MAINTENANCE TASKS. Using Form A3.1.7b, categorize all maintenance tasks, following the procedures described for operator tasks in activity A3.2.1.

A3.3 Select Tasks for Training

OVERVIEW

PURPOSE. During this activity mission critical/high risk training tasks for which training must be provided before or during Operational Test I are identified by the training developer and reviewed by the materiel developer. This list of tasks is attached to the Letter of Agreement (LOA, Event A5).

TSM/AO RESPONSIBILITY. Coordinate selection of tasks and assure preparation of appropriate lists of mission critical/high risk training tasks.

SOURCES OF ASSISTANCE. Representatives from JCD, DTD, and materiel developer.

PROCEDURES

A3.3.1 DEVELOP TASK SELECTION CRITERIA: OPERATOR TASKS. TRADOC 350-30, Vol. I, provides information on how to select tasks for training. The primary problem after rating duties/tasks on various criteria, is to decide what factors will be used as a basis for selection. Some tasks are simple enough so that no training is required; they can be learned on the job with no assistance. Other tasks will not be performed until two or three years after formal training; these tasks should not be taught. In practical terms, lack of funds limits the amount of training that can be undertaken.

The following procedures offer an approach to making rational judgments on selecting operator tasks for training:

- a. Request DTD to establish a policy for selecting tasks. Examples of policy might be:
 - (1) Train on tasks that are above average in learning difficulty, as judged by ratings based on: (a) Learning Difficulty, (b) Probability of Deficient Performance, and (c) Tolerance for Delay of Task Performance. These ratings are provided in Columns A, B, and C of Form A3.1.7a.
Select all tasks having a rating sum (Col. D) of 7 or less.
 - (2) Select all tasks having a rating of 1 or 2 on the Inadequate Performance scale (Col. E, Form A3.1.7a).
 - (3) Select all tasks having a rating sum of 7 or less in Col. D and a rating of 2 or less in Col. E, Form A3.1.7a.
 - (4) Train on tasks rated high on one, or a combination, of the eight factors listed under Activity A3.1.7 (e.g., select all tasks frequently performed by operators). Procedures for doing this can be found in TRADOC Pamphlet 350-30.

- b. If a task selection policy has not been established, use the criteria listed under "a(3)" above.

A3.3.2 DEVELOP TASK SELECTION CRITERIA: MAINTENANCE TASKS. The criteria for selecting maintenance tasks for Operational Test I may be different from those used to select operator tasks. This should be determined through discussions with DCD and the materiel developer. For example, in OT I player personnel may not be required to perform system maintenance; it might be provided by contractor personnel.

This criterion development activity for maintenance tasks can be conducted concurrently with activity A3.3.1 for operator tasks, following the same procedures.

A3.3.3 PRELIMINARY SELECTION OF OPERATOR TASKS. Using Form A3.1.7a:

- a. Identify by check () in Column G (Critical/High Risk Tasks) those operator duties/tasks that meet selection criteria (e.g., rating sum of 7 or less in Col. D and 2 or less in Col. E).
- b. In Column H (OT I Tasks), identify by check () those operator duties/tasks recommended for training prior to OT I. Base these judgments on tentative decisions as to the probable nature of OT I and the types of operator tasks that will be performed during that test. For example, is it likely that a certain portion of the system will not be ready for operational testing at OT I? If so, tasks related to that portion of the system should not be taught prior to OT I.

A3.3.4 PRELIMINARY SELECTION OF MAINTENANCE TASKS. Using Form A3.1.7b:

- a. Identify by check () in Column G (Critical/High Risk Tasks) those maintenance duties/tasks that meet selection criteria.
- b. In Column H (OT I Tasks), identify by check () those maintenance duties/tasks recommended for training for OT I.

A3.3.5 REVIEW AND REVISE TASKS SELECTED FOR TRAINING. Forms A3.1.7a and A3.1.7b should be sent to the materiel developer with a request to review and suggest revisions to the information in Columns E through H of the two forms.

A3.4 Analyze Training Modes

OVERVIEW

PURPOSE. During this activity preliminary decisions are made about the instructional setting(s) that should be used to support operator and maintenance training. Due to the lack of information about the new system, many judgments will have to be based on how comparable tasks are taught for comparable systems. These judgments should be made by persons who are familiar with training for other systems--persons from DTD and the appropriate Academic Department(s). The judgments should be reviewed and approved by DCD and by the materiel developer.

TSM/AO RESPONSIBILITIES. Same as for A3.1, Identify Mission Critical/High Risk Training Tasks (page III-18).

SOURCES AS ASSISTANCE. Same as for A3.1 (page III-18. TRADOC Pamphlet 350-30, Vol. 1 (pp.230-263) provides guidance regarding how to select instructional settings.

PROCEDURES

A3.4.1 IDENTIFY TRAINING MODES FOR OPERATOR TASKS. For each anticipated operator duty position, prepare a list of mission critical/high learning risk tasks. Derive this list from the list of operator tasks prepared during activity A3.3 and contained in Form 3.1.5. Enter the task reference numbers on Form A3.4.1 (Training Modes Analysis, Figure III-7).

- a. For each operator task determine whether a similar operator task is or is not taught currently. Record YES or NO in Column B (Now Taught?), Form A3.4.1.
- b. If task is currently taught, determine whether it is taught during resident or non-resident training.
 - (1) If task is taught in resident training, determine if it is taught in a resident school or in an installation support school. In Column C (Resident), Form A3.4.1, record answer as: RS = Resident School; ISS = Installation Support School; Unk = Unknown.

Date _____
 AO _____
 (name) _____
 (phone) _____

TRAINING MODES ANALYSIS

Type of Task _____ Developing System _____ (name)

Duty Position _____

<u>Task Ref. No.</u>	<u>Now Taught?</u>		<u>Location/Type of Training</u>		<u>Tng. Adeq.</u>	<u>Training Problem</u>	<u>Training Solution</u>	<u>Training Mode</u>	
	<u>YES</u>	<u>NO</u>	<u>Resident</u>	<u>Non. Res.</u>				<u>1st Choice</u>	<u>2nd Choice</u>
(A)	(B)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)

Figure III-7. Form A3.4.1, Training Modes Analysis

- (2) If task is taught in non-resident training, determine if it is taught by formal on-the-job training (FOJT) or Self-Teaching Exportable Packages (STEPS), or is covered in a Job Performance Aid (JPA). In Column D (Non-Resident), Form A3.4.1, record FOJT, STEPS, JPA, or Unk.

NOTE: Strictly speaking, JPAs are not a form of training. Rather, they are a substitute for training.

A3.4.2 JUDGE ADEQUACY OF CURRENT OPERATOR TRAINING. Before current operator training practices are accepted, a brief evaluation of their effectiveness should be made. Feedback from course instructors, and comments from former students or from field commanders may have identified duties/tasks that are not being taught satisfactorily. Also, recent research and studies may have developed better teaching modes/methods for certain tasks. For example, studies are continuously undertaken to validate and improve the use of JPAs (Job Performance Aids) and STEPs (Self-Teaching Exportable Packages).

- a. For each operator task listed on Form A3.4.1 as being currently taught, judge whether that task is currently:

1. taught satisfactorily
2. taught to minimum standards but needs improving
3. taught in an unsatisfactory manner

Record judgment in Column E (Training Adequacy), Form A3.4.1.

- b. For those tasks/duties not currently taught (duties/tasks found on the developing system only), the judgments of the committee on task analysis should reflect the following professional opinions:

1. capable of being taught satisfactorily
2. uncertain if can be taught satisfactorily
3. cannot be taught satisfactorily using known techniques

A3.4.3 IDENTIFY OPERATOR TRAINING PROBLEMS/POSSIBLE SOLUTIONS

- a. For each task judged as 2 or 3 during activity A3.4.2, note briefly (Col. F, Training Problem, Form A3.4.1), the nature of the training problem. Options include: lack of satisfactory training equipment; training too costly/too long; not enough qualified instructors; unknown.
- b. For each of the above tasks, provide a possible solution (Col. G, Form A3.4.1), if one can be identified. State solutions very briefly, such as: Use JPA, STEPS: switch to resident training; get improved training devices; etc.
- c. For developing systems it is quite probable that you will be uncertain how to teach certain duties/tasks effectively. Identify these tasks by recording "unknown" in Column G, Form A3.4.1.

A3.4.4. SELECT OPERATOR TRAINING MODE. Review each of the operator tasks

listed on Form A3.4.1:

- a. Select the preferred mode of training (1st choice).
 - (1) Formal on-the-job training (FOJT)
 - (2) Self-Teaching Exportable Packages (STEPS)
 - (3) Job Performance Aids (JPAs)
 - (4) Resident School (RS)
 - (5) Installation Support School (ISS)
- b. Select an alternative and acceptable mode of training (2nd choice).
- c. Record as "uncertain" if there is some doubt as to the cost-effective way to teach a task.
- d. Record as "unknown" if a task is currently taught unacceptably and a training solution is not apparent. Record "unknown" for those new duties/tasks for which no acceptable training mode is currently obvious.

Record above judgments in Columns H and I, Form A3.4.1.

A3.4.5 THROUGH A3.4.8 SELECT TRAINING MODE FOR MAINTENANCE DUTIES/TASKS.

Select maintenance duties/tasks by repeating the steps described in activities A3.4.1 through A3.4.4 for operators. Using Form A3.4.1, prepare a separate set of forms for each anticipated maintenance duty position.

A3.5 Analyze Training Device Requirements

OVERVIEW

PURPOSE. The development of a training concept is the responsibility of the training developer, usually the Directorate of Training Development for the proponent school. This concept becomes one of the TRADOC inputs to the prime system Letter of Agreement (LOA). Usually training devices are developed on a schedule that permits testing them during Operational Test II (during Phase III of the LCSMM). However, training devices often are costly items with a long lead-time. Therefore, the need for the devices must be identified early in the LCSMM so that funds can be dedicated for their development and purchase. For those programs where the training risk is high, prototype devices may be developed as a part of the Validation Phase and evaluated during DT/OT I (the Validation Phase of the LCSMM).

TSM/AO RESPONSIBILITIES. The TSM/AO is responsible for assuring that the need for training devices is considered before the LOA is prepared. The Directorate of Training Development should be asked to analyze the requirements. PM TRADE (U.S. Army Project Manager for Training Devices, Orlando, FL) may be contacted for assistance.

SOURCES OF ASSISTANCE. This activity should be performed by persons familiar with the classroom use of training devices. Guidance for the identification of training device requirements and for the acquisition of training devices can be found in the DARCOM/TRADOC Technical Documentation and Training Acquisition Handbook (Chapter V), and in TRADOC Circular 70-80-1, Training Device Development.

PROCEDURES

A3.5.1 COLLECT DATA ON DEVICES USED IN TEACHING OPERATOR TASKS. Conduct a brief analysis of the use of training devices in support of operator tasks presently taught in resident school.

- a. Using Form A3.5.1 (Training Device Requirements Work Sheet, Figure III-8), record for each operator position the Reference Number of each operator task listed on Form A3.1.7a (Identification of Mission Critical/High Risk Training Tasks: Operator Tasks). Record this number in Column A.
- b. In Column B, note briefly the type of training device used: none, mock-up, part-task trainer, simulator, etc. (Use of local terms is acceptable).
- c. In Column C, briefly note the type of learning/training supported by training devices. Record:

K/C	=	Acquisition of knowledge/concepts
PL-PT	=	Procedural learning: Part-task
PL-WT	=	Procedural learning: Whole-task
SA-PT	=	Skill Acquisition: Part-task
SA-WT	=	Skill Acquisition: Whole-task
SR-PT	=	Skill Retention: Part-task
SR-WT	=	Skill Retention: Whole-task
None	=	Training device not currently used
New	=	New duty/task

A3.5.2 EVALUATE EFFECTIVENESS OF CURRENT OPERATOR DEVICES. Review each of the operator tasks and judge whether or not current use of training devices is effective. Base judgment on reports from instructors. Record in Column D, Form A3.5.1:

1. Current device effective
2. Current device marginally effective, needs improvement
3. Current device unsatisfactory

Date _____
A0 _____
(name) _____
(phone) _____

Name of Developing System _____

Name of Comparable System

Operator/Maintenance Position

Task Ref. No.	Current Device	Le/Tng Supported	Device Effect.	Device Rqmts.	Current Problems	Solution	Ing. Device Preference	
							1st Choice	2nd Choice
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)

A3.5.3. EVALUATE NEED FOR OPERATOR TRAINING DEVICES. For operator tasks that are currently taught using training devices, and that are similar to those which must be taught for the new system, judge whether or not a training device is needed for the new system.

- a. If the current training device is effective, it probably is appropriate for use with the new system. Before making a decision check briefly to determine whether a more effective device has been developed/purchased recently.
- b. For those tasks for which a current training device is not effective or only marginally effective, consider the following options:
 - (1) Discontinue use of a training device.
 - (2) Use a different kind of device; e.g., use a simulator instead of a mock-up.
 - (3) Improve the present device, assuming you can state how it should be improved.
 - (4) Investigate one or more training device options because it is not clear what type of device would be most effective.

As each operator task is examined, record tentative decision about training devices in Column E. Record:

- NO - 0 - Training device not now used and not needed in future
- NO - 1 - Discontinue use of training device
- YES - 2 - Use different type of device
- YES - 3 - Improve present device
- YES - 4 - Investigate type of device that will be most effective

A3.5.4 ANALYZE DEVICE NEEDS IN NEW OPERATOR TASKS

- a. In Column B, Form A3.5.1, note all operator tasks that are "new.", i.e., pertain only to the system under development.
- b. For each "new" duty/task, note in Column C the type of learning that could be supported by a training device. Use options listed under Activity A3.5.3.
- c. In Column E, record judgment as to need for training device.

Record: YES = some type of device needed;

NO = no device needed.

A3.5.5 THROUGH A3.5.8 ANALYZE TRAINING DEVICE REQUIREMENTS FOR MAINTENANCE

TASKS. Determine training device requirements for maintenance tasks by repeating the operator activities described in A3.5.1 through A3.5.4 for each maintenance task listed on Form A3.1.7b. Make entries on Form A3.5.1, Training Device Requirements Work Sheet.

A3.6 Analyze Training Devices: Detailed

OVERVIEW

PURPOSE. The activity is a continuation of A3.5, Analyze Training Device Requirements. Its purpose is to specify training device requirements in more detail, and to identify some of the problems which should be anticipated while developing the devices.

TSM/AO RESPONSIBILITY. Same as for A3.5 (Page III-41).

SOURCES OF ASSISTANCE. Same as for A3.5 (Page III-41).

PROCEDURES

A3.6.1 ANALYZE TRAINING DEVICE REQUIREMENTS: OPERATOR TASKS

- a. Using Form A3.5.1, Training Device Requirements Work Sheet, review each task for which a training device requirement is noted in Column E.
 - (1) In Column F, note any problems with a current training device. Instructors can provide this information. Problems may include: device unreliable; does not support training effectively; difficult to use, etc.
 - (2) In Column G, record any solutions that instructors can propose in response to problems with a training device.
- b. When considering a new duty/task, note in Column F any anticipated problems. In Column G, either propose a solution to an anticipated problem, or recommend that the training device requirement receive further study.

A3.6.2 IDENTIFY TRAINING DEVICE PREFERENCES: OPERATOR TASKS

- a. In Column H, Form A3.5.1, record first preference for training device. Options include simulator, mock-up, part task trainer, etc. Additional information about these options can be found in TRADOC Pamphlet 350-30, Vol. III, page 106.
- b. In Column I, record second preference for training device. Because of their expense and long lead-time, it is seldom possible to develop/purchase all desired training devices. Rather, the minimum number of different kinds of devices that will satisfy the training mission will be identified. It is for this reason that first and second choices for training devices are stated. This same situation applies to most other modes and methods of training.

A3.6.3 ANALYZE TRAINING DEVICE REQUIREMENTS: MAINTENANCE TASKS. To develop detailed training device requirements for maintenance tasks, repeat the procedures described in A3.6.1 for operator tasks.

A3.6.4 IDENTIFY TRAINING DEVICE PREFERENCES: MAINTENANCE TASKS. To develop detailed training device preferences for maintenance tasks, repeat the procedures described in A3.6.2 for operators.

A3.7 Analyze Requirements for Embedded Testing/Training

OVERVIEW

PURPOSE. During the activity, consider the possibility of embedding all or portions of the training subsystem package within the operating system and then using the system itself to present and manage the training. This possibility can be studied only for those proposed systems that will have a large computer capacity. Such systems offer an inherent capability for using the computer portion of the system to accomplish Computer Managed Instruction (CMI), Computer Assisted Instruction (CAI), or simulation exercises. The Army's TACFIRE system is an example of a new system in which embedded testing/training has been incorporated.

TSM/AO RESPONSIBILITIES. The TSM/AO is responsible for seeing that a statement about the possible use of embedded training is prepared and attached to the prime LOA. The AO should request the DTD to prepare this statement, using information provided by the materiel developer and the combat developer.

SOURCES OF ASSISTANCE. Representatives of combat developments and training developments of the proponent school; the materiel developer; PM TRADE; the U.S. Army Training Support Command. The material cited in this section is based on Chapter 5.0, Acquisition of Embedded Training Capabilities, DARCOM/TRADOC Technical Documentation and Training Acquisition Handbook.

PROCEDURES

Activities A3.7 and A3.8 are performed concurrently and in accordance with the steps described in the following paragraphs.

A3.7.1 GATHER BACKGROUND INFORMATION

- a. Identify persons within the school who can help determine the potential for using embedded training with the new system. These should be the same persons who already have been tasked to identify operator and maintenance duties/tasks, and their training requirements.
- b. From the materiel developer and/or DCD, obtain information about anticipated excess computer capacity under:
 - (1) Operational conditions -- Will the computer be fully used during system operation? Will access to computer terminals be available?, etc.
 - (2) Non-operational conditions -- Is the computer available for use when the system is non-operational? Can instructional terminals be tied into the computer?, etc.

A3.7.2 DETERMINE FEASIBILITY OF USING COMPUTER FOR EMBEDDED TRAINING.

During this activity tentative decisions are made about using some form of embedded training (ET) or testing. In general, embedded training/testing can be considered when the following four questions can be answered with a YES:

- a. Is there a means for input of the ET software system and courseware into the computer?

- b. Is there adequate storage space (computer memory) for storing the ET software system and courseware?
- c. Is there an adequate set of remote terminals to permit intended users (authors, students, etc.) access to and use of the ET capabilities?
- d. Is there a means for passing control from the operational system to the ET system so that it can operate?

Quite possibly the current design of the system, especially its computer complex, does not provide for one or more of the above conditions. However, it may be possible to redesign the computer complex so that the above conditions are met. (All possibilities should be considered). Later, the materiel developer will be given an opportunity to comment on the impact of ET on the design of the system.

A3.7.3 DECIDE TYPE OF ET TO RECOMMEND. Embedded training/testing refers to three different options--a testing option, a training option, and an option of presenting simulation exercises. The options are:

- a. CMI (Computer-Managed Instruction) -- Training is conducted off-line, using conventional methods. The computer is used to score tests, maintain records, assign the next block of instruction, and in general manage the sequence of instruction. CMI is useful when it is desirable to use a variety of conventional or self-instructional technologies. The student can study on his own, using a variety of materiel, then take a test. The computer can score the test, provide the student with remedial training guidance, update training records which later can be reviewed by an instructor, and so on.
- b. CAI (Computer-Assisted Instruction) -- The operational computer is used to present lesson material, tests, and practical exercises. Training management also can be accomplished using the computer. This training method is useful when you want students to learn on their own, but wish to lead them through a sequence of instruction that is well thought out and designed. Also, the student can be presented with a variety of drill and practice exercises, depending on his responses to previous test items. Instructors (authors) can have direct access to the instructional material while it is under development (on-line authoring).

- c. Simulation -- The operational computer is used to provide simulated problem situations and exercises similar to those encountered in the tactical operation. It is useful when the trainee wishes to acquire or to maintain high proficiency at handling certain problem situations.

Select one or more of the above options for further consideration. If CAI or Simulation has been selected and not CMI, proceed to activity A3.8, Analyze CAI/Simulation Requirements. If CMI is chosen, read the following section.

A3.7.4 DETERMINE CMI FUNCTIONAL REQUIREMENTS. The functional requirements for a CMI capability are discussed in the DARCOM/TRADOC Technical Documentation and Training Acquisition Handbook (beginning on page 5-2). The basic CMI applications program functions for enabling this capability consist of:

- a. CMI executive control
- b. Data base creation and update
- c. Performance data collection
- d. Performance data scoring
- e. Prescriptive reporting

If a decision is made by the committee on task analysis during Activity A3.7.5 to recommend CMI, the above functional requirements should be noted in the training annex to the LOA.

A3.7.5 REVIEW CMI FUNCTIONAL REQUIREMENTS WITH MATERIEL DEVELOPER. The requirements for CMI may have a major impact on system design. This should be determined in consultation with the materiel developer. If the materiel developer offers strong opposition to the use of CMI, the training developer should reconsider his position. A decision to recommend CMI should be based on a gross cost-effectiveness analysis of the advantages to be gained through the use of CMI, versus the additional cost and problem of redesigning the materiel system so that it has a CMI capability.

A3.7.6 PREPARE JUSTIFICATION DOCUMENT FOR CMI. A recommendation for CMI must be incorporated into Section V of the LOA and into the LOA training annex. No format has been specified for presenting information in support of CMI, but the format for a training device letter of agreement (TDLOA) is appropriate. This format and the contents of a TDLOA are described in TRADOC Circular 70-80-1.

The need for CMI should be justified by describing the training need, how the CMI capability will be used, and the CMI system itself and where and how it will be used (including the functional requirements that must be met). Other areas that should be addressed include: prospective effectiveness and cost; system development events that must be undertaken by the training developer, materiel developer, and logistician; development schedule and milestones; and a funding estimate.

A3.8 Analyze CAI/Simulation Requirements

OVERVIEW

PURPOSE. This activity is a continuation of Activity A3.7, Analyze Requirements for Embedded Testing/Training. Proceed with it if a decision was made during A3.7 to consider the use of system computer(s) for presenting Computer-Assisted Instruction or Simulation Exercises.

TSM/AO RESPONSIBILITIES. Assure that a statement about the use of embedded training is prepared, if a decision has been made to recommend embedded training. Task appropriate proponent school personnel to consider CAI and simulation. Coordinate decision to recommend CAI or simulation with materiel developer. Staff decision paper with School Commandant.

SOURCES OF ASSISTANCE. Same as for A3.7 (Page III-46).

PROCEDURES

A3.8.1 DEVELOP FUNCTIONAL REQUIREMENTS FOR CAI. Proceed with this activity only if CAI was recommended for further consideration during Activity A3.7.3,

Decide Type of ET to Recommend.

- a. Identify limitations and/or constraints that may have to be observed in designing CAI capability. These may include:
 - (1) Program language compatability requirements
 - (2) Central computer hardware characteristics and communications channels
 - (3) Program timing requirements
 - (4) Storage media (core, disc, tape, etc.)
 - (5) Character manipulation for input and output
 - (6) Remote terminal characteristics (display formatting, capacities, interactive features, etc.)
- b. Develop functional requirements, limitations, and constraints on system design. This should be done by persons from proponent school who are knowledgeable in CAI techniques. Contact PM TRADE or USATSC for assistance in identifying subject matter experts.

A3.8.2 DEVELOP FUNCTIONAL REQUIREMENTS FOR SIMULATION. Proceed with this activity only if simulation was recommended for further consideration during Activity A3.7.3. Guidance for this activity is the same as that provided for Activity A3.8.1.

A3.8.3 REVIEW CAI/SIMULATION REQUIREMENTS WITH MATERIEL DEVELOPER. The guidance for this activity is the same as provided for Activity A3.7.5, Review CMI Functional Requirements With Materiel Developer (see page III-49).

A3.8.4 PREPARE CAI/SIMULATION JUSTIFICATION DOCUMENT. The guidance for this activity is the same as provided for activity A3.7.6, Prepare Justification Document for CMI (see page III-50).

A3.9 Summarize Training Device Requirements

OVERVIEW

PURPOSE. During this activity, training device requirements identified during Activities A3.5 (Analyze Training Device Requirements) and A3.6 (Analyze Training Devices: Detailed) are summarized for each operator and maintenance duty position. The summaries should be suitable for attachment as annexes to the prime system Letter of Agreement. Give special emphasis to the training device requirements for tasks that must be taught before Operational Test I.

TSM/AO RESPONSIBILITIES. Assure that summary documents are prepared, and that they are reviewed and approved by the School Commandant.

SOURCES OF ASSISTANCE. Same as for A3.5 (Page III-41).

PROCEDURES

A3.9.1 SUMMARIZE REQUIREMENTS: OPERATOR TRAINING

- a. Using Form A3.5.1 (Training Device Requirements Work Sheet) as a data base, summarize the training device requirements for each operator position. Form A3.9.1 (Summary of Training Device Requirements, Figure III-9), illustrates an acceptable format for this summary.
- b. Be certain to note, in Column D, any anticipated problems. Note if the referenced task is a new one which needs further study to determine training device requirements.
- c. In Column E check all requirements that must be met for OT I.

A3.9.2 SUMMARIZE REQUIREMENTS: MAINTENANCE TRAINING

- a. Using Form A3.5.1 as a data base, summarize training device requirements for each maintenance position. Record on Form A3.9.1.
- b. Note anticipated problems/issues for study in Column D.
- c. Check requirements that must be met for OT I (in Col. E).

SUMMARY OF TRAINING DEVICE REQUIREMENTS

Developing System _____

Operator/Maintenance Tasks (Circle appropriate label)

Job Position Title _____

Date _____

A0 _____

(name)

(phone)

Type of Tng Device (A)	Task Ref. Number (B)	Type of Le/Tng Supported (C)	Anticipated Problems/Issues for Dstudy (D)	Needed for OT I? (E)

Figure III-9. Form A3.9.1. Summary of Training Device Requirements

A3.10 Identify Tasks To Be Trained using Other Modes

OVERVIEW

PURPOSE. During activity A3.4, Analyze Training Modes, tentative decisions are made about the preferred mode of training for Mission Critical/High Risk Training Duties/Tasks. During this activity (A3.10), those tasks which will be supported by a training mode other than by resident training or by installation supported school(s) are examined in more detail. In particular, the need for Skill Performance Aids, (SPAs), material is identified.

TSM/AO RESPONSIBILITIES. Assure that activity is accomplished by tasking appropriate school personnel in DTD and Academic Department(s); coordinate training recommendations with materiel developer and with school administration.

SOURCES OF ASSISTANCE. The same sources as for Event A3.4 (Page III-37). Information about the acquisition of SPAs material can be found in the DARCOM/TRADOC Technical Documentation of Training Acquisition Handbook.

PROCEDURES

A3.10.1 BECOME FAMILIAR WITH SPAS PROGRAM. As noted in the Training Acquisition Handbook, "The SPAS approach to training acquisition integrates the development of technical documentation -- in the form of highly illustrated, simple to read manuals -- with the development of fully compatible, performance oriented training materials. A basic concept underlying this approach is that the amount of resources that must be devoted to training is tied directly to how well the technical documentation communicates to the soldier the information he needs to perform his tasks in the on-the-job setting. Also, where practical, the training is presented in a self-paced, self-teaching, exportable form for use in the units where the soldier spends most of his time."

An overview of the SPAS program and the process for developing SPA material are presented in Chapter 4 of the DARCOM/TRADOC Training Acquisition Handbook. This material should be read. The SPAS program, which formerly was called the Integrated Technical Documentation and Training (ITDT) Program, is now an integral feature of all systems development. Table III-2 outlines the contents of a typical SPAS package.

Identify one or more resident experts on SPAS requirements. If none exists at your school, consult USATSC for source of subject matter expert.

A3.10.2 REVIEW TRAINING MODE CHOICES FOR NON-RESIDENT TRAINING: OPERATOR TASKS

- a. Using Form A3.4.1 (Training Modes Analysis) for operator tasks, review recommended training mode choices for all non-resident tasks:
 - (1) For each task consider whether task is best covered under the SPAS program. Note that SPAs (Job Performance Aids) and STEPs (Self-Teaching Exportable Packages) are produced as part of a SPAS program.
 - (2) For each task estimate whether or not coverage in operator/maintenance manuals will be/can be clear and precise enough to preclude the need for supporting training material.
 - (3) For FOJT tasks (Formal On-the-Job Training) consider the use of unit training exercises.
- b. On the basis of the above review, change, as desired, the choice in entries recorded in Columns H and I, Form A3.4.1. As appropriate, record SPAs, Unit Training, etc.

A3.10.3 IDENTIFY/ANALYZE COLLECTIVE TRAINING TASKS: OPERATOR TASKS. So far Event A3 has emphasized individually performed tasks, primarily because these are the tasks that may have to be taught prior to OT I. However, it is possible that selected collective (crew) tasks must be taught in preparation for OT I. These tasks must be identified and briefly analyzed to determine their training requirements. This task can be assigned to DCD with assistance from OTD.

Table III-2

CONTENTS OF A TYPICAL SPA PACKAGE

DOCUMENTATION

- o Maintenance Manuals (JPM format)*
 - Volumn I: Reference Data and Installation Instructions
 - Volumn II: Scheduled Maintenance
 - Volumn III: Troubleshooting
 - Volumn IV: Corrective Maintenance
- or ("new look" format)*
- TM 9 -xxx-xxx-20: Organization Maintenance
- TM 9 -xxx-xxx-30: Direct Support Maintenance
- TM 9 -xxx-xxx-40: General Support Maintenance
- o Operators Manual ("new look" format)
 - Chapter 1: Introduction
 - Chapter 2: Operating Instructions
 - Chapter 3: Maintenance Instructions
 - Chapter 4: Maintenance of Auxiliary Equipment
 - Chapter 5: Ammunition

TRAINING

- o Training Management Guide (TMG)
- o Student Guide (SG)
- o Job Performance Guide (JPG)
- o Lesson Administrative Instructions (LAI)
- o Student Lesson Sheets (SLS)
- o ETM Media Materials (Options)
 - Track 1: Audio Visual
 - Track 2: Written
 - Track 3: Audio
 - Other : (CAI, simulation devices, etc.)

* Manuals will use either JPM or "new look" format, depending on specific system application.

- a. Using a form comparable to Form A3.4.1 (Training Modes Analysis), request DCD to identify collective (crew performed) tasks that may be required for Operation Test I (OT-I). Follow procedures for completing Form A3.4.1 (see discussion of activity A3.4.1, Page III-37).
- b. Request DCD to perform a brief analysis of the criticality/learning difficulty of the tasks identified. Record the findings from this analysis on Form A3.1.7a, Identification of Mission Critical/High Risk Training Tasks: Operator Tasks.
- c. Complete a Training Modes Analysis work sheet (Form A3.4.1) for the tasks.
- d. Complete a Training Device Requirements work sheet (Form A3.5.1) for the tasks.

A3.10.4 IDENTIFY COLLECTIVE TRAINING TASKS: MAINTENANCE TASKS. Collective maintenance tasks are quite rare, and seldom have to be taught prior to OT I. Usually contractor maintenance is used during DT/OT I. Determine from the materiel developer if this policy will be followed. If not, request DCD and the materiel developer to identify those collectively performed maintenance tasks that must be or may have to be taught by the proponent school in preparation for OT I.

Analyze the training requirements for these tasks as described under activity A3.10.3 for operator tasks.

A3.11 Summarize Training Mode Recommendations

OVERVIEW

PURPOSE. This activity is comparable to activity A3.9 (Summarize Training Device Requirements, Page III-52). Its purpose is to summarize, for operator positions, maintenance positions, and collective tasks, the training mode recommendations developed during activities A3.4 (Analyze Training Modes) and A3.10 (Identify Tasks To Be Trained Using Other Modes, Page III-54).

TSM/AO RESPONSIBILITIES. Assure that summary documents are prepared and that they are reviewed by appropriate school personnel and by the Commandant.

SOURCES OF ASSISTANCE. Same as for A3.4 (Page III-37) and A3.10 (Page III-54).

PROCEDURES

A3.11.1 SUMMARIZE TRAINING MODE REQUIREMENT: OPERATOR TRAINING

- a. Using Forms A3.1.4 (Identification of System Components and Assemblies) and A3.4.1 (Training Modes Analysis) as a data base, summarize the training mode requirements for each operator position. Form A3.11.1 (Summary of Training Mode Requirements, Figure III-10, page III-59) illustrates an acceptable format. Group all 1st choice training modes together on one page.
- b. In Column D note any anticipated problems. Note if the referenced task is a new one that needs further study to determine the appropriate training mode.
- c. In Column E check all requirements that must be met for OT I.

A3.11.2 SUMMARIZE TRAINING MODE REQUIREMENTS: MAINTENANCE TRAINING

- a. Using Forms A3.1.4 and A3.4.1 as a data base, summarize training mode requirements for each maintenance position. Record on Form A3.11.1.
- b. Note anticipated problems/issues for further study in Column D.
- c. In Column E check requirements that must be met for OT I.

A3.11.3 SUMMARIZE TRAINING MODE REQUIREMENTS: COLLECTIVE OPERATOR TASKS.

Follow procedures outlines in A3.11.1.

A3.11.4 SUMMARIZE TRAINING MODE REQUIREMENTS: COLLECTIVE MAINTENANCE

TASKS. Follow procedures outlined in A3.11.2.

SUMMARY OF TRAINING MODE REQUIREMENTS

Date _____
 AO _____
 (name) _____
 (phone) _____

System under development _____

Operator Position _____

1st Choice Training Mode _____

Task Ref. No.	2nd Choice Trng Mode	Recommended Training School/Location	Anticipated Problems	Rqmt for OT I?
(A)	(B)	(C)	(D)	(E)

Figure III-10. Form A3.11.1, Summary of Training Mode Requirements

EVENT A4 -- PERSONNEL REQUIREMENTS

OVERVIEW

Purpose

The purpose of this event is to prepare an initial concept of the types and numbers of persons needed to man the proposed system. Estimates also are developed regarding the skills required of all operator and maintenance personnel, the particular physical and mental characteristics which these persons should possess, and the means by which any special human resources requirements will be developed.

Relation to Other LCSMM/IPS Events

This event makes use of the same data base described for Event A2, and in addition uses information developed during Events A2 and A3.

TSM/AO Responsibilities

The combat developer performs the detailed activities. The TSM/AO is responsible for tasking DCD, for obtaining inputs and comments from the Soldier Support Center and MILPERCEN, and for summarizing the event products into a form suitable for use by those assigned to prepare the Letter of Agreement (Event A5). This summary takes the form of a Target Audience Description.

Phasing

Detailed consideration of personnel requirements can begin once operator and maintenance positions have been identified and tasks selected for training (Events A3.1 through A3.3). Event A4 must be completed in time for its output to be incorporated into the LOA. Also, this output should be available in draft form before the OICTP (Individual and Collective Training Plan, Event A7) is prepared.

INPUT DATA/DATA BASE FOR EVENT A4

Data Bases for Events A2 and A3

Events A2, A3, and A4 use similar data bases. These include: Mission Element Needs Statement (MENS); Science and Technology Objectives Guide (STOG); material concept descriptions; mission profile; data from similar systems; future plans for recruitment, force structure, and manpower. Function allocation data developed for Event A6, and information based on the professional judgment of Subject Matter Experts (SMEs) are employed also.

Personnel Requirements for Other Systems

Each new system must compete with other systems, both existing and proposed, for personnel. If possible, information should be obtained about competing requirements for those MOSs and skill levels being considered. This information, if available, can be obtained from the Soldier Support Center or from the proponent school for the MOSs of interest.

Recruitment Plans

Recruitment plans can provide an estimate of the availability of various types of persons in future time frames. Descriptions of recruitment plans can be obtained from SSC.

OUTPUTS AND END PRODUCTS FOR EVENT A4

The output of Event A4 is a document that describes (a) personnel requirements by MOS and skill level; (b) numbers of personnel required; (c) any special mental, physical, or attitudinal requirements; (d) concept for obtaining the necessary human resources; and (e) problems that need future study. This information becomes the basis for the Tentative QQPRI.

REFERENCES

- AR 10-38, U.S. Army Concepts Analysis Agency
- AR 71-9, Materiel Objectives and Requirements

AR 310-49, The Army Authorization Documents System (TAADS)

TRADOC Regulation 700-1, Integrated Logistic Support

DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook

MITRE Corporation, A Guide for TRADOC System Managers

ARI-TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A4

Functional analysis and comparability analysis procedures are used to accomplish this event. As in input, the Materiel Concept Investigation (A1) should provide a concept of the materiel and the role of equipment operators, maintenance personnel, and crews. As described for Event A2 (pp. IIII-4 through III-13), this information is used to conduct a crude task and skill analysis. The goal of this analysis is to develop a matrix for each major portion of the proposed system, showing the functional performance required of people with respect to the system.

As further described under Events A2 and A3 (see especially A3.1, pp. III-18), a comparability analysis of this matrix then is performed to identify those materiel subsystems and human performance requirements that are comparable to existing subsystems and performance requirements.

Any subsequent analysis of this data base prior to LOA preparation is based either on historical data or on professional judgment. Historical data form the basis for making judgments and estimates related to comparable subsystems and personnel requirements. Professional judgments of training personnel and field personnel can be used when making initial decisions about new materiel subsystems and new personnel requirements.

As part of Event A3, the human performance requirements of operator and maintenance duty positions are examined with respect to the training requirements they impose (see Activity A3.3, Analyze Training Requirements, page III-34).

In this event, A4, this analysis is extended to include personnel requirements. For each proposed duty position the following questions should be answered:

- a. What MOS and skill level are necessary for this position?
- b. How many persons, by MOS and skill level, are needed?
- c. Does performance in this position demand persons with special physical or mental characteristics? If so, what are they?
- d. What is the potential availability of the required personnel?
- e. If the required people may not be available, what means can be used to obtain them or develop a human resource pool?

Answer the above questions with reference to the data collection/data processing forms (Identification of Mission Critical/High Risk Training Tasks) prepared during Activity A3.1.7 (pp. III-29 through III-30). These forms (Form A3.1.7a and Form A3.1.7b) list all the tasks that must be performed by various operator and maintenance positions for the new system. Column F of these forms indicates the duty position tentatively assigned to accomplish each listed task.

Base answers to the foregoing questions on historical data when possible. MOS and skill level requirements (question "a") can be estimated by asking such questions as: What MOS and skill levels are used with comparable systems? Have these proven to be the correct MOS and skill levels for manning that type of system? Does the materiel concept and/or the operational concept suggest that a new MOS or a combined MOS be developed?

The number of persons required (question "b") can best be answered by consulting the mission profile prepared by those investigating the materiel concept (Event A1). This profile should describe the number of materiel units required for mission accomplishment and the role of the people who conduct the mission. The task and skill analysis performed as part of Event A2 is based on an estimate of the number and type of persons required for a single unit of materiel.

Multiplying these single unit numbers by the number of equipments required for a mission will provide a minimum estimate of the total numbers of persons required by MOS and skill level.

Analysis of each functional performance requirement in terms of special physical and mental requirements should utilize historical data whenever possible. When these characteristics pertain to functions or material subsystems not comparable to anything that exists, the estimates will be very tenuous; nevertheless, a "best estimate" should be provided. When this "best estimate" relates to what appears to be a critical function, note this as a critical issue for study.

During work on Event A2, future availability of various types of persons will be considered. Refine these considerations on the basis of Event A4 activities. Update any initial estimates of MOS, skill level, and numbers of personnel requirements developed as part of Event A2. These revised estimates which are based on data and estimates provided by MILPERCEN, should be reviewed with the Soldier Support Center to identify potential shortfalls. From this information estimates of human resources requirements can be developed. Essentially this involves outlining a plan to obtain persons through such means as recruitment, diversion from other systems, or training. The impact of diverting personnel from other systems should be assessed. In particular, the impact of supporting a new system while a to-be-replaced system is being phased out should be estimated.

The foregoing considerations may affect training requirements and plans as outlined during Event A3. Before these plans are incorporated into the LOA, they should be reviewed to assure that they are compatible with any special resource development requirements identified during Event A4.

Throughout this event, consideration should be given to any limitations or constraints imposed by the MENS or by the Project Manager on skills, training, and/or personnel. Issues that cannot be resolved should be identified as issues for further study. In particular, potential non-availability of persons with suitable characteristics in required numbers should be noted.

EVENT A5 -- LETTER OF AGREEMENT (LOA)

OVERVIEW

Purpose

The Letter of Agreement (LOA) documents the agreement between TRADOC and DARCOM as to the nature and characteristics of the proposed system, and the investigation(s) needed to (a) develop and validate the system support concept; (b) define the associated operational, technical, and logistical support concepts; and (c) promote synchronous interaction between the combat developer and the materiel developer (AR 71-9). The LOA describes the specific studies that the combat developer, materiel developer, logistician, trainer, and administrator must accomplish to develop the proposed system and validate estimates of personnel and training requirements.

Relation to Other LCSMM/IPS Events

The LOA is based on information developed during the Materiel Concept Investigation (Event A1 in the IPS model) conducted by the materiel developer and on investigations of personnel and training requirements (Events A2, A3, and A4) conducted by the combat and training developers. All subsequent actions in the LCSMM deal with the study and validation of concepts and issues contained in the LOA.

TSM/AO Responsibilities

The TRADOC proponent school has primary responsibility for preparing the LOA. The proponent school prepares a preliminary LOA and forwards it to the materiel developer, the Logistics Center, and the Soldier Support Center for review and input. The proponent school, or a joint working group if required, refines the draft LOA on the basis of comments received from the reviewers. The document is then coordinated with interested TRADOC/DARCOM elements for comment and concurrence.

Phasing

This event should be accomplished as early as possible during Phase I of the LCSM. Approval of the LOA is required before subsequent LCSM events can proceed.

INPUT DATA/DATA BASE FOR EVENT A5

Training and Personnel Support Concept

The training and support concept is a brief outline of the proposed training system including training developments required, and the concept of how the training will be managed and administered. This material consists of the collective outputs of Events A2, A3, and A4. It should be available by the time LOA preparation begins and can be obtained from the TRADOC system proponent, usually the DTD of the proponent school.

Issues and Recommendations for Further Study

This brief statement of the critical training and personnel support issues that must be resolved includes suggested studies needed for their resolution. This information is contained in the outputs from Events A2, A3, and A4. The information can be obtained from the TRADOC system proponent and should be available prior to LOA preparation.

Estimates of Training Development Costs

A gross estimate of the cost of the proposed system is developed during preparation of an Individual and Collective Training Plan (OICTP/ICTP, Event 7) and is contained in sub-paragraph 7.h of that document. These estimates can be obtained from DTD and should be available by the time the LOA is in its final stages of development.

Estimated Schedule for Training Development

A brief outline of the key events in the development of the training support system is developed along with an estimate of when these events will be completed. This information is developed for sub-paragraph 7.2 of the OICTP/ICTP (Event 7). The estimates should be available sometime during the period of LOA preparation and can be obtained from DTD.

Draft OICTP

The draft OICTP is prepared concurrently with the LOA. Both use the same data base. However, many estimates relating to the training support system are developed during preparation of the OICTP. For this reason final preparation of the LOA will have to await development of the OICTP, especially paragraph 7, the Details paragraph.

OUTPUTS AND END PRODUCTS FOR EVENT A5

The output of Event A5 is the Letter of Agreement, the requirements document that, if approved, serves as the basis for committing 6.3A or 6.3B funds to further develop the proposed system. The LOA guides subsequent investigations during Phase I of the LCSMM. In particular, the LOA outlines the direction of further development and costing of the training plan. Subsequent training-related events during Phase I are directed toward validating concepts in the LOA. The results of these validation studies are used to update these concepts. The updated versions are described in an Outline Acquisition Plan (Event A10). The schedule for completion of the LOA will be determined by TRADOC.

REFERENCES

AR 71-9, Material Objectives and Requirements, (Appendix D, Format for Letter of Agreement)

TRADOC Circular 70-80-1, Training Device Development, (Appendix B, Training Device Letter of Agreement (TDLOA))

OTEA, Operational Test and Evaluation Methodology Guide, (Example 3.1, Letter of Agreement)

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems, (Section 4.3, Letter of Agreement)

EXAMPLES AND ILLUSTRATIONS

- a. The LOA format description, from AR 71-9, is shown in Figure III-11.
- b. An illustration of an LOA is reproduced following the LOA format illustration as Figure III-12.

PROCEDURES

Event A5 can be divided into five elements as shown in Table III-3.

Procedures for accomplishing each of these event elements are provided on the following pages.

A5.1 Gather Background Data

OVERVIEW

PURPOSE. The LOA summarizes information developed early in the LCSMM.

During Event A5.1 the CD/AO identifies and collects relevant data, identifies sources of assistance, and determines staffing requirements.

TSM/AO RESPONSIBILITIES. The CD/AO is responsible for this activity.

SOURCES OF ASSISTANCE. See paragraph A5.1.2.

PROCEDURES

A5.1.1 COLLECT RELEVANT DOCUMENTS. The previous paragraph titled "Input Data/Data Base for Event A5" lists the key documents to obtain prior to preparing the LOA. Especially look for any document that describes issues in need of investigation or problems in need of resolution. The MENS may describe issues and problems for study. It also may describe constraints on training and personnel. The forms completed during Event A3, Analyze Training Requirements, will summarize issues and problems uncovered during the initial analysis of training requirements. If a copy of AR 71-9 is not already available, one must be obtained.

FORMAT FOR LETTER OF AGREEMENT (LOA)

LOA submitted to DCSOPS will be in the format provided below. Information indicated in that format should be provided to the extent such information is available. The LOA should contain the minimum information necessary to adequately describe the system.

1. NEED.

a. A brief description of the threat, in terms of the collection capabilities of the enemy to locate and target the proposed system; then the enemy destructive capabilities to exploit this information. Current systems used to counter the threat, the systems to be replaced and the timeframe for which the new capability is needed will then be enumerated. Detailed Threat Annex will be attached as Annex C.

b. Catalog of Approved Requirement Documents (CARDS) reference number: (To be assigned by DA ODCSOPS).

2. OPERATIONAL CONCEPT.

a. A description of the role of the system on the battlefield and its relationship to other systems, multilateral developments and emerging US tactics.

b. The mission profile will be attached as Annex A.

3. SYSTEM DESCRIPTION.

a. A statement indicating the principal characteristics expected to be included in the system to include how the system will defeat the threat, what counter-countermeasures will be considered, what the system looks like and those technological alternatives that have a reasonable chance of developmental success. Included, if applicable, must be requirements and provisions (to include communications) for interoperability; continuity of operations (CONOPS); security; reliability, availability, and maintainability (RAM), standardization to include commonality for hardware and software to which the system will adhere; nuclear survivability; collective protection equipment; adverse weather/reduced visibility conditions (full ECM, smoke/obscurants, etc., rain, fog, haze, dust, etc.).

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Figure III-11. Format for Letter of Agreement (LOA)
(From AR 71-9)

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b. A discussion of other service, NATO/ABCA, or other allied nation interest in the Army development/procurement. Include data on other service or allied developments with a view toward establishing potential for standardization/interoperability, or co-production. Include data on potential for procurement of allied nation items/system.

4. PROSPECTIVE OPERATIONAL EFFECTIVENESS AND COST. A realistic quantitative estimate of the operational effectiveness we will gain from the new alternatives when compared with the system to be replaced. This paragraph should include a subparagraph which identifies the estimated cost of the new capability. It should also include a subparagraph which identifies the estimated additional manpower requirements or manpower savings of the new capability on a per system, using unit, and total Army basis.

5. SYSTEM DEVELOPMENT. This paragraph is divided into operational, technical, logistical, training and manpower sub-paragraphs. Each sub-paragraph describes the system unique events which the combat developer, materiel developer, logistician, trainer and administrator must undertake to produce the total system. Include manpower constraints related to mission area or force level. Include commitment to assess alternatives to reduce manpower requirements or increase productivity.

6. SCHEDULES AND MILESTONES. A listing of the significant events and their times, which will be conducted as a result of the particular LOA.

7. FUNDING. A broad estimate of the Advanced Development (AD), Engineering Development (ED) and Unit Flyaway Costs. The AD and ED costs will be broken down by fiscal year and expressed in constant dollars. This paragraph will also identify the number of prototypes which will be fabricated.

ANNEX A - Operational Mode Summary/Mission Profile - A list of tasks and conditions in terms of frequency and urgency visualized for system conditions in terms of frequency and urgency visualized for system employment in military operations. The Mission Profile is logically derived from the Operational Concept and provides the starting point for developing the system characteristics.

ANNEX B - Coordination Annex - List all commands, other services allied nations and activities with whom the LOA was coordinated and provide full rationale for nonacceptance of comments, if any.

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Figure III-11. (Continued)

ANNEX C - Threat Annex - A detailed threat package to include coverage of the total threat the proposed system is expected to face on the battlefield over its life cycle, to include those threat systems it is designed to counter as well as those threat systems which counter or degrade the proposed system will be specified. This Annex will be classified as required and withdrawn and handled as a separate document to facilitate transmittal, as required.

ANNEX D - Rationale Annex - Supports various characteristics stated in the LOA.

ANNEX E - RAM Annex - Supports the stated RAM characteristics.

NOTE: Only Annexes A&B are required to be forwarded to HQDA.

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Figure III-11. (Continued)

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LETTER OF AGREEMENT
(ZERO-MISS ANTITANK PROJECTILE (ZAP))

1. NEED FOR THE SYSTEM.

a. A requirement exists for an antitank system with firepower in excess of the current existing anti-armor capability and with mobility and survivability at least equal to the current capability in order to counter an increasing potential armor threat. Potential enemy forces possess a massive quantitative superiority in amount of immediately applicable armor force. The most serious threat tactic is rapid penetrations of defensive lines by concentrated armor forces resulting in highly destructive and disruptive armor actions deep in friendly positions. Armor is massed at the last possible moment to avoid presenting a lucrative nuclear target and then attacks in mass across a small front. Points of strong resistance are by-passed and left for follow-up forces. At present, the balance of capability is presented by a qualitative superiority on the part of the US Army and its allies in both armor and anti-armor capability. However, recent intelligence indicates that potential enemy forces are currently developing new armor systems which will have a clear qualitative advantage in the next decade. An increased US armor capability is now in development, but has a high risk of success within the required time frame. To counter the increasing potential armor threat, the US Army needs an antitank system with firepower in excess of the current existing anti-armor capability and with mobility and survivability at least equal to the current capability. The increase in firepower must include an increase in lethality, range, and accuracy. Since accuracy of current antitank weapons is already high, the required capability is for a perfect or near-perfect probability of hit at tactical engagement ranges.

b. The CARDS reference number: INF XXX

2. SYSTEM CONCEPT.

a. Firepower. The system is to have greater firepower than the current existing systems. The increase in firepower is to include perfect hit accuracy, longer effective ranges than the current systems, and increased lethality against tanks.

b. Mobility. The system is to equal or exceed current anti-armor mobility which includes ground-mounted, vehicle-mounted, and helicopter-mounted configurations.

c. Survivability. The system is to equal or exceed current anti-armor weapons survivability. This includes a capability for stand-off engagements beyond the most effective ranges of current threat direct fire weapons. Exposure time during firing must be less than the most effective response times of threat weapons.

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Figure III-12 (Continued)

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d. Logistics. The system is to be supportable by a combat arms division in combat operations. This includes reliability, availability, maintainability, and supply expenditures under operational conditions that permit essentially full capability of the system at all times.

3. PROSPECTIVE RELATIVE EFFECTIVENESS.

The new Zero-miss Antitank system will be able to detect threat armor targets out to ranges of approximately 7 km and engage them effectively out to ranges of 4 to 5 km. The system must be operable during day/night and adverse weather conditions. The current anti-armor systems have only a limited capability under night or adverse weather conditions, and have maximum effective ranges less than or equal to 3 km. The technology for the new system is state-of-the-art and as such is "known." The "unknowns" will influence the optimization of the system but are not of sufficient impact to preclude the new system being a major improvement over the existing system.

4. PROSPECTIVE UPPER LIMIT ON UNIT COST. \$0.25 million each.

5. INVESTIGATIONS NEEDED TO DEVELOP.

a. Operational Employment Concepts. Since the system is planned to be a direct replacement for existing systems and operate in a similar manner, the combat developer will conduct an analysis to determine if the much greater capabilities of the new system will impact on employment and firing doctrine. An operational test will be conducted to ascertain whether the ZAP system, as represented by the test beds, has unique operational capabilities beyond those achievable by the present systems in the field. The combat developer will explore the tactical boundary capabilities of the system using a two sided tactical model, will conduct FDTE or examine FDTE issues in OT I, and will participate closely in development testing DT I and operational testing OT I.

b. Technical Concepts. The materiel developer plans to contract for two test beds to be built using diverse technological approaches. A DT/OT I type test will be conducted on both systems. The materiel developer will develop simulations to explore the technical boundary capabilities of each system. The materiel developer will also forecast required improvements to complementary equipment interfacing with the proposed system.

c. Logistical Support Concepts. Evaluation will be conducted throughout the validation program to assess how the ZAP system can be logistically supported when fielded. Based upon investigation and results of early evaluations, a logistic concept will be jointly formulated by TRADOC and DARCOM. This evaluation will include an analysis of systems reliability, availability, and maintainability (RAM) characteristics to establish requirements.

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Figure III-12 (Continued)

6. UNKNOWNNS TO BE RESOLVED: Operationally, the most significant weapon system unknowns impact on employment techniques, firing doctrine, and system operational effectiveness. Specifically, items to be resolved by modeling, FDTE or OT I include:

a. Operational capabilities of the system based on the weapon hit and kill probabilities under various types of combat conditions.

b. System operational effectiveness against the predicted threat in the IOC time frame.

c. Suitability of the system in meeting the tactical requirements of the combat user to include identification of applicable doctrine, employment techniques, and organization.

d. Identification of potential training requirements for service schools and operational units.

Developmental unknowns include those impacting on inherent system effectiveness and compatibility of the new system. Specifically, unknowns to be resolved through simulation of DT I include:

a. P_h and P_k capabilities.

b. Needed improvement in ammunition design, specifically fusing to meet the projected requirement.

c. Potential reliability, availability, and maintainability requirements to include the extent and utility of BITE.

d. Estimate of environmental performance to include susceptibility to EW.

e. Future development/production cost schedule and risk.

7. TECHNICAL RISKS. The following are considered technical risks associated with the weapons program:

a. Improvement of ammunition performance consistent with other system capabilities.

b. Effective counter-countermeasures designs.

8. SCHEDULES AND MILESTONES.

a. ZAP test bed program will be initiated in FY 76 and terminated in FY 78.

b. The RFP, for two contractual solicitations, will be completed by Fourth Quarter FY 75.

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Figure III-12 (Continued)

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c. Contract awarded to two best proposals by First Quarter FY 76.

d. Initial test and evaluation will be initiated in Third Quarter FY 77 and completed by Second Quarter FY 78.

e. Modeling and simulation effort will be initiated in First Quarter FY 76 and completed by Second Quarter FY 77.

f. ASARC I decision scheduled for Third Quarter FY 77.

9. CRITICAL ISSUES FOR TEST.

a. Determine the test bed p_h and P_k - these values should be developed primarily through development testing but consideration should also be given to development of values under operational conditions and congruent with the expected threat (DT I and OT I).

b. Determine if the test bed can survive environmental conditions - this should include examination of EW capability as well as related reliability, availability, and maintainability requirements under those conditions (DTI and OT I).

c. Determine if the role of the system, as currently envisioned is still valid - this includes evaluation of proposed required doctrine, employment and organization concepts and addresses required system interface with current inventory items (FDTE and OT I).

10. FUNDING.

a. Advanced Development (6.3) (inflated FY 74 \$ in millions):

<u>FY 75</u>	<u>FY 76</u>	<u>FY 77</u>	<u>FY 78</u>	<u>TOTAL</u>
\$0.1	\$13.1	\$2.0	\$15.3	\$2.0

NOTE: Quantity of Test Beds: 2.

b. Engineering Development (6.4) (inflated FY 74 \$ in millions):

<u>FY 78</u>	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>TOTAL</u>
\$15 to 20	\$25 to 30	\$20 to 25	\$20 to 25	\$80 to 100

NOTE: Quantity of Prototypes: 12.

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Figure III-12 (Continued)

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c. Unit Flyaway Costs:

<u>ITEM</u>	<u>UNIT COST</u>	<u>QUANTITY</u>	<u>LEARNING SLOPE</u>
Aero-miss Antitank	\$9.25 to 9.35	450 to 500	97%

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Figure III-12 (Continued)

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Table III-3

ELEMENTS AND PROCEDURAL STEPS FOR EVENT A5,
LETTER OF AGREEMENT (LOA)

A5.1 GATHER BACKGROUND DATA

- 5.1.1 Collect Relevant Documents
- 5.1.2 Identify Sources of Assistance
- 5.1.3 Collect Illustrations
- 5.1.4 Identify Coordination Requirements
- 5.1.5 Identify Requirements for Preparing OICTP

A5.2 PREPARE SCHEDULE

- 5.2.1 Identify Due Dates
- 5.2.2 Identify Who Prepares the LOA
- 5.2.3 Develop Schedule for LOA Preparation

A5.3 PREPARE DRAFT LOA

- 5.3.1 Prepare Need For System Paragraph
- 5.3.2 Prepare Operational Concept Paragraph
- 5.3.3 Prepare System Description Paragraph
- 5.3.4 Prepare Prospective Operational Effectiveness and Cost Paragraph
- 5.3.5 Prepare System Development Paragraph
- 5.3.6 Prepare Training Support Concept Sub-Paragraph
- 5.3.7 Prepare Schedules and Milestones

A5.4 COMPLETE DRAFT LOA

- 5.4.1 Obtain Inputs
- 5.4.2 Establish JWG to Refine LOA

A5.5 LOA COORDINATION/STAFFING

A5.1.2 IDENTIFY SOURCES OF ASSISTANCE. Within the proponent school the DCO and the DTU will be responsible for preparing portions of the LOA. In either case, when it is feasible school personnel who participated in Event A3 also should assist in its preparation.

Portions of the LOA are prepared by the materiel developer, the LOGCEN, and the Soldier Support Center (see Figure III-13). It is especially important that early inputs be obtained from the materiel developer.

In addition to providing review, the U.S. Army Training Support Center (USATSC) can be contacted for guidance during LOA preparation.

A5.1.3 COLLECT ILLUSTRATIONS. AR 71-9 describes the format for the LOA. This description is reproduced in Figure III-11, and an illustration of a LOA is reproduced in Figure III-12. A "strawman" training paragraph for incorporation into an LOA has been prepared by USATSC and is reproduced under activity A5.3.6. The DCO of the proponent school may have LOAs for other systems on file.

A5.1.4 IDENTIFY COORDINATION REQUIREMENTS. LOA coordination requirements are set forth in AR 71-9. The requirements are extensive, and are summarized in Figure III-13. Note the many TRADOC and other Army elements that must review the LOA. Close and continuous coordination with the materiel developer is mandatory since both TRADOC and DARCOM must sign the LOA. As noted in AR 71-9, staffing of the LOA will vary slightly depending on the estimated cost of the system.

Annex B of the LOA, the Coordination Annex, lists all commands, other services, allied nations, and agencies with whom the LOA must be coordinated. To compile this annex, it is recommended that a "Coordination Requirements" table be prepared. In this table list all commands, nations, agencies, and so forth that must review or provide inputs to the LOA. List these organizational elements in the approximate order in which coordination should be undertaken. If possible, note the approximate date for forwarding the LOA to and receiving comments from these elements.

EXPLANATION OF ALTERNATIVE SYSTEM CONCEPT PHASE

TRAINING ACTIVITIES	DCSD	DIST	TSM	PROPOSED SCHOOL	BARCOM	CAC	ADMIN-EN	ADMIN-EN SCHOOL	LOC-EN	LOC-EN SCHOOL	ATSC
MENS	R/C/A			P	I	R	R	N/I	R	R	R
Concept Investigation				P/A	I		R	N/I	R	R/I	
OICTP	R	R	R	P	I		R	R/I	R	I	R/C
LWA		R	R	P	I	R	R	R/I	R	I	R
CFP (CUBA & CTEA)	R	R	R	P	I	R	R	N/I	R/I	I	R
Outline Acquisition Plan (Sec V & VI)		R	I	I	P	R	R	N/I	R/I	I	R

P = Primary Proprietary
R = Review Within Mission Area
I = Input
C = Coordinate as Matter of Mission
IC = Internal Coordination
A = TRADOC Approval Authority

Figure III-13. Training Activity Responsibilities and Coordination Requirements (From Appendix B, TRADOC Circular 351-8)

A5.1.5 IDENTIFY REQUIREMENTS FOR PREPARING OICTP. An Outline Individual and Collective Training Plan (OICTP) "is required for all developing materiel systems. It will be submitted to HQ TRADOC at the same time as the Letter of Agreement (LOA)". The requirement for this document is described in TRADOC Circular 351-8. Procedures for preparing the OICTP are described under Event A7 of this handbook. The products of Event A3, Analyze Training Requirements, provide the data base for the OICTP and for portions of the LOA.

A5.2 Prepare Schedule

OVERVIEW

PURPOSE. The process of preparing and staffing a LOA is quite lengthy, and many organizational elements provide inputs to or review the draft document. For this reason the LOA preparation schedule requires careful consideration.

TSM/AO RESPONSIBILITIES. An TSM/AO is responsible for developing the basic schedule.

SOURCES OF ASSISTANCE. See paragraph A5.2.2 and AR 71-9.

PROCEDURES

A5.2.1 IDENTIFY DUE DATES. The materiel developer prepares a master schedule for system development. A copy of this schedule should be on file with the DCD of the proponent school. It will contain the approximate date when the approved/authenticated LOA must be ready for submission to HQDA. For non-major system, authentication may come from DARCOM. A draft LOA should be available at least 120 days prior to this date, since the review and revision process for a LOA is quite long. See AR 71-9 for further guidance.

A5.2.2 IDENTIFY WHO PREPARES THE LOA. The DCD of the proponent school will prepare the draft LOA "with as much information as available at the time" (AR 71-9). Specifically, DCD will prepare paragraphs 1, 2, and 3 of the LOA.

JCD also prepares Annexes A, B, C, and D with guidance from other directorates of the proponent school.

The remaining sections of the LOA are prepared by DCD using inputs from other organizational elements.

- a. The materiel developer and the DTD will provide cost estimates for paragraph 7 (funding) of the LOA and for the estimated cost sub-paragraphs of paragraph 4.
- b. Paragraph 5 of the LOA consists of a number of sub-paragraphs, with responsibility for preparing these sub-paragraphs as follows:
 - (1) Operation issues/events/problems are addressed by the combat developer.
 - (2) Technical issues/events/problems are addressed by the materiel developer.
 - (3) Logistical issues/events/problems are addressed by the Logistics Center.
 - (4) Training sub-paragraphs are prepared by the DTD of the proponent school.
 - (5) Personnel sub-paragraphs are prepared by the DTD with assistance from the Soldier Support Center.

A5.2.3 DEVELOP SCHEDULE FOR LOA PREPARATION. Based on due dates identified during A5.2.1 and on review requirements as outlined in AR 71-9, develop a schedule for LOA preparation. If possible, allow at least 120 days for preparation and staffing. Contact the AO for the materiel developer and determine his availability for a joint working conference to review an early draft of the LOA. Also contact the AOs at the Logistics Center, the Soldier Support Center and other interested schools, and alert them to the upcoming requirement to prepare sections of the LOA.

A5.3 Prepare Draft LOA

OVERVIEW

PURPOSE. The initial draft of the LOA, prepared in as much detail as possible, provides the basis for inputs and comments by other interested agencies.

TSM/AO RESPONSIBILITIES. The combat developer AO is responsible for overseeing the development of the draft LOA. AOs associated with the training developer, materiel developer, the LOGCEN School, the Soldier Support Center, and other interested schools are responsible for selected inputs.

SOURCES OF ASSISTANCE. See AR 71-9 and paragraph A5.1.2 (page III-79).

PROCEDURES

A5.3.1 PREPARE NEED FOR SYSTEM PARAGRAPH. Paragraph 1, Need, of the LOA should briefly describe the threat the system is designed to counter. This paragraph should be a summary of Annex C, the Threat Annex, of the LOA. The combat developer should prepare Annex C on the basis of threat analysis information contained in or attached to the MENS. Figure III-11, containing the format for Letter of Agreement (LOA), describes more fully the contents of Annex C and paragraph 1 of the LOA. An illustration is presented in Figure III-12, a sample LOA for the Zero-Miss Antitank Projectile (ZAP).

A5.3.2 PREPARE OPERATIONAL CONCEPT PARAGRAPH. Paragraph 2, Operational Concept, of the LOA contains a brief description "of the role of the system on the battlefield and its relationship to other systems, multilateral developments and emerging US tactics." This paragraph is a summary of the information contained in Annex A of the LOA, Operational Mode Summary/Mission Profile. Information on the operational concept for the proposed system would be available in the MENS. Annex A and Paragraph 2 of the LOA should be prepared by the Combat Development Directorate.

A5.3.3 PREPARE SYSTEM DESCRIPTION PARAGRAPH. Paragraph 3, System

Description, should summarize the principal characteristics expected of the system. It does not need to describe the physical characteristics of the system, but it must summarize the functional requirements that the system must meet (see illustration in Figure III-12). Information about functional requirements can be obtained from DCD and from the materiel developer. Paragraphs 2 and 3 of the LOA illustration in Figure III-12 collectively describe functional characteristics.

At this stage in system development it may not be possible to describe the requirements for the system precisely. However, you should note whether the new system must equal or must exceed the capabilities of the system it is to replace.

A5.3.4 PREPARE PROSPECTIVE OPERATIONAL EFFECTIVENESS AND COST PARAGRAPH.

Paragraph 4 of the LOA summarizes the estimated increase in operational effectiveness to be gained by developing the new system. This paragraph, to be prepared by the combat developer, should briefly compare the proposed system with present capabilities. It should describe what the new system can do that present systems cannot do.

The estimated cost of the proposed system should be summarized in a sub-paragraph. This estimate should be based either on a "Prospective Upper Limit on Unit Cost" figure contained in the MENS, or on a summary of cost estimates provided by the organizational elements that prepare the sub-paragraphs for paragraphs 5 and 7 of the LOA. At a minimum the cost estimate should describe the probable cost per system unit. This cost figure should be adjusted upward to reflect any significant costs identified by the logistician and trainer.

A new system may have no impact on manpower requirements, or may decrease or increase these requirements. The impact of the new system on manpower requirements should be summarized in a sub-paragraph. This information, to be prepared by the combat developer, is based on data contained in the mission profile. Any increase or decrease in manpower identified by the trainer also should be noted.

A5.3.5 PREPARE SYSTEM DEVELOPMENT PARAGRAPH. Paragraph 5 of the LOA consists of a series of sub-paragraphs, each prepared by a different organizational element -- the combat developer, materiel developer, logistician, trainer, and administrator (see A5.2.2). Each sub-paragraph must describe the major events/issues/problems that must be undertaken/addressed during system development. The combat developer and the trainer should prepare their respective sub-paragraphs for the draft LOA. The LOA then is sent to the other agencies with a request to prepare similar sub-paragraph in their area of responsibility.

A5.3.6 PREPARE TRAINING SUPPORT CONCEPT SUB-PARAGRAPH. A "strawman" sub-paragraph for the trainer (Figure III-14) covers the major training events and issues that must be addressed prior to OT I. The illustration will fit most developing systems, but each portion should be examined carefully to assure that it meets the requirements of the particular system under consideration. As appropriate, delete, modify, or add to the sub-paragraph contained in the illustration. The training developer should be given this assignment.

A5.3.7 PREPARE SCHEDULES AND MILESTONES. The combat developer should prepare a draft outline and schedule of the significant events that will be conducted as a result of the LOA. All other elements providing inputs to or reviewing the draft LOA should be asked to provide inputs to (if appropriate) or review this schedule.

SAMPLE FOR LETTER OF AGREEMENT

d. Training Support Concept: The DARCOM materiel developer, in coordination with the TRADOC proponent, will develop a training subsystem to support _____

(1) The material developer, in coordination with the TRADOC proponent, will develop a detailed training subsystem capable of providing a complete transfer of knowledge from the developer to the system user and maintainer. This training subsystem will be based upon a precisely defined set of performance requirements obtained through analysis or collection of Logistic Support Analysis (LSA) data generated in accordance with DARCOM PAM 750-16 or MIL-M63035, as appropriate. Based on the results of this analysis, DARCOM/TRADOC will jointly agree upon a detailed task list covering all operator and maintenance difficult to train task list covering all operator and maintenance difficult to train tasks for the system. The identification of and agreement on these tasks will be a formal, identifiable milestone in the validation phase of development. Tasks so identified will be incorporated into a signed agreement and into the system outline acquisition plan.

(2) TRADOC will describe the user population to the materiel developer and assist the materiel developer in identifying any unusual training requirements inherent in the intended user population.

(3) The DARCOM materiel developer will develop an outline of each TM to be produced, and preliminary draft documentation and story-board training materials for tasks selected for training in accordance with approved skill performance aids specifications (SPAS). Deliverable products for DT/OT I will be determined between DARCOM and TRADOC on a case-by-case basis. The draft documentation and training produced as a result of this determination will be used to train operator/crew and maintenance personnel representatives of the user population for OT I.

(4) The need for training requirements and materials, such as classroom trainers or collective trainers, which are not identified as a result of the SPAS work effort, will be investigated. The necessary TRADOC/DARCOM responsibilities and resources to develop these training materials will be established and requirements will be included in the ROC or separate requirement documents, as appropriate.

(5) TRADOC will develop an outline individual and collective training plan (OICTO), outlining the initial system training concept and strategy and as much of the individual and collective unit and institutional training requirements as known.

(6) The capability of the player personnel, trained with the draft documentation and storyboard training materials, to perform the task selected for training to the required standards in the field phase of OT I Will be made a critical test issue.

Figure III-14 "Strawman" Training Support Concept Sub-Paragraph
for an LOA

A5.4 Complete Draft LOA

OVERVIEW

PURPOSE. During this activity, inputs to the LOA are obtained from the materiel developer, LOGCEN, the Soldier Support Center, and other interested schools.

TSM/AO RESPONSIBILITIES. The AO is responsible for forwarding the incomplete LOA to the materiel developer and to other TRADOC elements for input. After the AO prepares a complete draft of the LOA, he forwards it to interested TRADOC and DARCOM elements for review and comment. Concurrence must be obtained from the materiel developer and the training developer.

SOURCES OF ASSISTANCE. General procedures for developing and staffing the LOA are presented in AR 71-9. Assistance is provided by the materiel developer, the logistician, and the Soldier Support Center.

PROCEDURES

A5.4.1 OBTAIN INPUTS. The draft LOA in its incomplete form should be sent to the materiel developer, the LOGCEN, and the Soldier Support Center.

- a. Ask the materiel developer to (1) review the System Description paragraph to assure that system functional characteristics have been stated correctly; (2) provide an appropriate sub-paragraph for the System Development paragraph; (3) prepare a draft of paragraph 7, Funding (at the least, he should provide a unit cost estimate for the system).

The materiel developer should provide an explanation for any special system characteristics that might be needed in order to remain within current state of the art. An explanation of unusually low or high unit costs should also be provided. These explanations are incorporated into Annex D, the Rationale Annex, of the LOA.

- b. Ask the LOGCEN to provide an appropriate sub-paragraph for the System Development paragraph. Any constraints on the support system for the proposed system should be noted, and the method that will be used to evaluate the logistical system should be mentioned. Cost for spare parts should be estimated.

- c. Ask SSC to provide an appropriate sub-paragraph covering manpower requirements, and noting special problems in obtaining personnel. Manpower constraints, if any, should be summarized.

A5.4.2 ESTABLISH JWG TO REFINE LOA. A Joint Working Group, if needed, will be formed to complete preparation of the draft LOA. The proponent TRADOC school will provide the chairman and the DARCOM proponent element will provide the vice-chairman. Request for DARCOM participation is made directly to the appropriate DARCOM subordinate element by the TRADOC proponent school, with an information copy to HQ TRADOC (DCSCD) and HQ DARCOM (AHCRC-PT).

A transmittal letter will establish a tentative meeting date for the JWG, if appropriate, and will request comments from addressees NLT 30 days from the date of the letter. In the event of no response from an addressee, concurrence will be assumed (except for DARCOM).

The JWG, or the proponent school, as appropriate, will:

- a. Refine the draft LOA on the basis of comments received.
- b. Attempt to resolve any differences identified during preparation of the LOA.
- c. Prepare the LOA according to the format shown in AR 71-9 and Figure III-11, this handbook.
- d. Coordinate the draft LOA with interested elements of TRADOC and DARCOM for comment/concurrence. Comments will be requested within 30 days; if they are not received, concurrence will be assumed.

A5.5 LOA Coordination/Staffing

OVERVIEW

PURPOSE. The draft LOA must be coordinated with and staffed through numerous TRADOC and DARCOM elements. This will assure that all appropriate issues are addressed in the LOA, and that TRADOC and DARCOM are in agreement regarding the actions that must be taken to assure system development.

TSM/AO RESPONSIBILITIES. The proponent school AO or the JWG as appropriate, is responsible for initiating the coordination/staffing of the draft LOA. Hereafter many other AOs assume responsibility for a portion of the coordination/staffing requirements. All of these requirements are described in detail in AR 71-9. This AR must be followed during the coordination/staffing process. Staffing requirements are shown also in Figure III-13.

SOURCES OF ASSISTANCE. See AR 71-9, Materiel Objectives and Requirements.

PROCEDURES. See AR 71-9.

EVENT A6 -- TASK LISTING

OVERVIEW

Purpose

During this event the outputs of Events A2, A3, and A4 are updated, through the use of information on how a function of the proposed system will be performed -- by machine, by humans, or by interaction of humans and machines (shared functions).

Relation to Other LCSM/IPS Events

Event A6 uses inputs from Event A3 (rough task and skill analysis), function allocation decisions made during Event A1, and descriptions of the system and mission profiles prepared by the materiel and combat developers. The list of critical tasks as identified during Event A6 provides the basis for subsequent personnel studies (Event A11) and for the development of the Outline Individual and Collective Training Plan (Event A7). During DT/OT I (Event B6) training procedures for providing a capability to handle "critical tasks" performed by humans are evaluated. It should be noted that the third element of this event, (A6.3), Review Lists of Critical, High Learning Risk Tasks, is closely related to Activity A3.1, Identify Mission Critical/High Risk Training Tasks (Page 32). A preliminary version of Event A6 could be performed prior to Event A3, and in fact this is what usually occurs.

TSM/AO Responsibilities

The "function allocation" portion of this activity is performed by the materiel developer -- by engineers and by human factors personnel. Also, the materiel developer will assist the combat developer in identifying mission critical tasks. The training developer is responsible for identifying high risk training tasks. The TSM/AO is responsible for tasking the combat and training developers, for obtaining inputs from the PM, and for staffing the outputs of the event with all interested organizational elements.

Phasing

This event may begin formally as soon as Events A3 and A4 are finished. It continues as long as different materiel concepts continue to be developed. For each materiel concept or major hardware variation, a separate set of data is prepared covering task listings, function allocations, and critical tasks. As noted earlier, this event may be performed on a preliminary basis prior to Events A2, A3, and A4.

INPUT DATA/DATA BASE FOR EVENT A6

Mission Profile

The description of the operational requirement(s) a system must meet to accomplish a particular mission or set of missions. The description includes the anticipated mix of ways in which the new system will be used in carrying out its operational role, the expected percentage of time that it will be exposed to various types of environmental/training conditions during the system's life, and the number of system units required for various missions.

List of System Functions

A list of functions which the system must be capable of accomplishing in order to meet mission requirements. For each item on this list there may be an indication of how that function will be accomplished -- by machine, by humans, or by human-machine interaction.

Outputs of Events A2, A3, and A4

See Outputs and End Products for Event A2 (Page 25), Event A3 (pp. 31-32), and Event A4 (Page 67).

OUTPUTS AND END PRODUCTS FOR EVENT A6

The function allocation portion of this event will produce a list of mission requirements, a list of system functional requirements for each mission requirement, and a decision as to how each functional requirement will be met. These data are used to update the products of Events A2, A3, and A4. Emphasis is on

updating Event A3 end products. Event A6 also produces Functional Flow Diagrams which can serve to instigate the study of alternative ways to meet mission goals. Such studies should be undertaken when it is judged that functions allocated to humans cannot be performed adequately.

REFERENCES

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development: Executive Summary and Model, 1 August 1975

ARI-TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

Fitts, P.M., et al. (Eds), Human Engineering for an Effective Air Transportation and Traffic Control System, National Research Council, Washington, DC, 1951

Meister, D., Human Factors: Theory and Practice, John Wiley & Sons, 1971

PROCEDURES

Procedural Strategy

When designing new equipment, engineers often make tacit assumptions about human capabilities and, when left to their own devices, will allocate functions to humans and to machines on the basis of personal experience and intuition. At the very least, these allocations should be verified by human factors specialists. As a corollary, function allocation by human factors specialists should be performed in close cooperation with design engineers. This will increase the probability that human factors considerations will have an impact on equipment design.

In Event A6, function allocation is followed by preparation or review of task listings for each function allocated in whole or in part to humans. These tasks then are analyzed for criticality -- both in terms of mission accomplishment and in terms of difficulty to obtain the desired human performance -- and

divided into "critical" and "non-critical" tasks. Development of training plans and materials for critical, high risk training tasks is emphasized until Operational Test I is completed; after that, training materials and devices are developed for all tasks selected for training.

A three-step process is employed to accomplish Event A6. First, major functions or tasks that must be performed for mission accomplishment are identified. Then, these functions are allocated according to whether they will be performed by humans, machines, or an interaction of humans and machines. Finally, those functions allocated in whole or in part to humans are analyzed to identify tasks that are critical for mission accomplishment and are "high risk" training tasks. The procedures for doing this have not been fully developed. The guidance provided in this handbook for Activity A3.1, Identify Mission Critical/High Risk Training Tasks, describes one set of procedures for identifying high risk training tasks.

As shown in Table III-4, Event A6 can be subdivided into six major activities.

A6.1 Identify Major Functions That Must Be Performed for Mission Accomplishment

The materiel developer performs this activity. However, training personnel may be asked to provide assistance, so the general procedures for performing this activity are described herein. Much of the discussion is based on a description by Meister (1971).

Event A6 begins with a review of the task listings prepared during Event A3, in Forms A3.1.5 and A3.1.7a and 7b. These listings are based on the equipment concept in existence at the time Event A3 was undertaken. If this concept has been revised/refined, then the task listings should be revised according to the procedures described under Event A3. The resulting task listings will still be quite general and in essence are descriptions of the functions that must be performed for mission accomplishment.

Table III-4

ELEMENTS OF EVENT A6, TASK LISTING

- A6.1 IDENTIFY MAJOR FUNCTIONS THAT MUST BE PERFORMED FOR MISSION ACCOMPLISHMENT
- A6.2 FUNCTION ALLOCATION
- A6.3 REVIEW LISTS OF CRITICAL, HIGH LEARNING RISK TASKS
- A6.4 REVIEW/REVISE PRODUCTS OF EVENT A3, TRAINING REQUIREMENTS
- A6.5 REVIEW/REVISE PRODUCTS OF EVENT A4, PERSONNEL REQUIREMENTS

The mission profile for the system should be examined carefully, and each system mission identified. To accomplish this, obtain and examine the most recent documents describing the system and its mission. To the extent possible, develop the following information items: (a) system missions/goals, (b) system inputs and outputs, (c) system capabilities and performance requirements demanded by system missions, (d) environmental factors that may affect system performance, and (e) system constraints. This information is generally developed in broad terms.

The analyst works from system performance goals to identify required functions. For each system mission the individual major operations that must be performed to accomplish the mission should be identified. This list of operations in effect becomes the functions that must be accomplished for each system mission.

For each system mission the required operations or functions should be displayed in the form of a functional flow diagram (FFD). As an illustration, the mission of "intercept enemy aircraft" can be analyzed into such functions as: detect presence of aircraft, identify aircraft, analyze threat of unidentified aircraft, decide if aircraft should be an acquisition target, select means of firing on aircraft, and so on. Figure III-15 is an FFD for accomplishing this "intercept aircraft" mission.

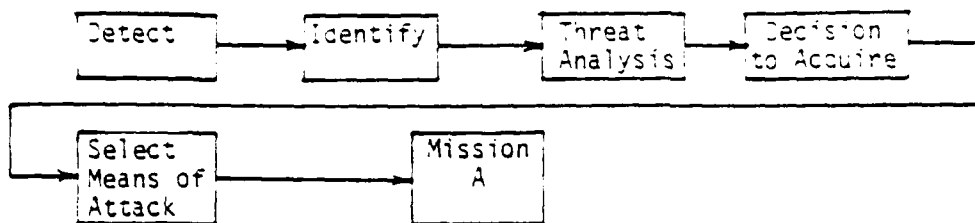


Figure III-15 Illustrative Functional Flow Diagram (FFD)
for Aircraft Intercept Mission

The initial version of a functional flow diagram is expanded by analyzing already identified functions to determine what inputs and outputs are required. Usually this analysis will identify additional functions that should be shown on the FFD. In Figure III-15, for example, it probably would be determined that the function of "threat analysis" should be initiated by the report of an unidentified aircraft. Thus, an additional function, "report unidentified aircraft," should be inserted in the FFD as shown in Figure III-16.

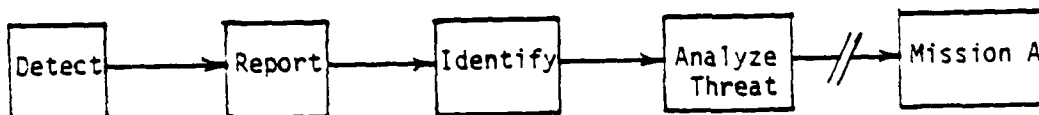


Figure III-16 First Expansion of FFD for Aircraft
Intercept Mission

The inputs to and outputs from each system function should be described in as much detail as possible. These descriptions should be in terms of functional requirements and should not imply the mechanism by which the inputs and outputs are produced. Environmental factors, performance requirements, and constraints that might impact on system functions or on function inputs and outputs should also be described.

Obviously, in many cases the foregoing analysis must be based on incomplete data. Historical data from comparable systems or subsystems should be used when available. Often the professional judgment of subject matter experts must be employed. It is likely that the process will identify gaps where further analysis must await refinement of the system concept.

A6.2 Allocate Functions

During this activity decisions are made as to those functions best performed by humans. Gross criteria for accomplishing this have been developed and have been cited in many human factors textbooks. Meister suggests that three different function allocation schemes be prepared. The first is based on the assumption that system functions will be implemented largely by hardware (automatic configuration). The second assumes that operator personnel will be primarily responsible for implementing system functions (manual configuration). The third assumes a man-machine mix (shared functions). Each of these alternatives should be displayed in the form of a Functional Flow Diagram.

What follows next is a series of informal trade-off studies. For each alternative the functions are examined to verify (estimate) that the hardware and the equipment operator(s) can perform their respective functions in accordance with system requirements. Admittedly this is an exercise in professional judgment; it is best performed by system designers and human factors personnel in collaboration. Then those alternatives that meet the criteria are briefly examined to determine whether their probable costs are within an acceptable range.

From the human factors standpoint, the process just described is of special importance if the goal is to influence system design. Before and immediately after acceptance of the LOA (Event A5), many alternative system configurations may be considered in rapid succession. A human resources specialist should be

part of the team considering the alternatives. The responsibilities of this specialist should include:

- a. Identification and/or verification of operator requirements.
- b. Verification that operator requirements can be performed satisfactorily (do not create excessive demands on operators).
- c. Examination of man-machine function allocation scheme(s) to:
 - (1) Identify human factors implications of design alternatives.
 - (2) Develop different allocation schemes, if judged to be a requirement.

During the examination of alternative system configurations, the human factors specialist should be willing to rapidly perform function allocation exercises, seeking the aid of design engineers, and should be willing to offer an informed opinion about the advisability of assigning various functions to humans.

A6.3 Review Lists of Critical, High Learning Risk Tasks

The previous activities in Event A6 provided a list of functions that must be performed by the system to accomplish mission objectives. Certain of these functions will have been assigned to be performed solely or in part by humans. This list (human-performed functions or tasks) is examined to identify (a) functions or tasks critical to mission accomplishment, and (b) "high risk" training tasks.

Mission critical tasks are those that must be performed accurately and in a timely manner; otherwise, a mission failure or serious degradation of system effectiveness will occur. These determinations are made by the combat developer with the assistance of the materiel developer.

High risk training tasks are those requiring skills that are difficult to acquire through training. Criteria that may be used for identifying such tasks

include: (a) level of skill or knowledge required for proficient performance, (b) complexity (number of skills and amount of knowledge required), and (c) training "distance" (difference between entry skills/knowledges and the levels required for proficient performance).

The procedures for identifying mission critical/high risk training tasks are described in this handbook under activity A3.1 (III-21 to III-33). During activity A6.3, the task listings developed during A3.1 are reviewed in light of the list of functions/tasks developed during activities A6.1 and A6.2. The listings prepared during activity A3.1 should be revised to reflect the latest concept(s) of the system.

A6.4 Review/Revise Products of Event A3, Training Requirements

Event A3 is concerned with identifying the training requirements for mission critical, high training risk tasks. The task listings developed during activity A3.1 are reviewed/revised during Activity A6.3. During activity A6.4 the outputs of activities A3.2 through A3.11 should be reviewed and revised to reflect changes in the task listings made during activity A6.3.

A6.5 Review/Revise Products of Event A2, Personnel Investigations

Revisions made to task listings during activity A6.3 may have an impact on personnel problems, manning concepts, and personnel issues that need further investigation. These are the end products of Event A2. They need to be reviewed and revised as appropriate in view of any changes in task listings developed during activity 6.3.

A6.6 Review/Revise Products of Event A4, Personnel Requirements

The outputs of Event A4 included descriptions of personnel requirements by MOS and skill level; numbers of personnel required; special mental, physical, and attitudinal requirements of system personnel; a concept for obtaining the

required human resources; and a list of problems in need of further study. These products should be reviewed and revised as needed to reflect recent personnel requirements as indicated by activity A6.3 task listings.

EVENT A7 -- INDIVIDUAL AND COLLECTIVE TRAINING PLAN

OVERVIEW

Purpose

The Outline Individual and Collective Training Plan (OICTP) serves two purposes. It provides detailed planning and baseline specifications for use by those organizations and activities primarily concerned with developing and implementing a training program for a new system. Second, it provides a reference document for those activities that may interface with or impact on training system development.

The OICTP describes a training concept in terms of who is to be trained; the skills that have to be taught; when, where, and how the training will be accomplished; and constraints on training requirements and resources imposed by design of the materiel system or by DA or DOD planning agencies. The OICTP concentrates on high risk training tasks and mission critical tasks as identified during Event A3, Training Requirements.

Relation to Other LCSMM/IPS Events

The initial identification of training requirements and the formulation of general training concept(s) are accomplished during Event A3. Outputs from Event A3 should be available before preparation of the OICTP begins. The outputs from Event A7 provide the basis for a Cost and Training Effectiveness Analysis (CTEA), which must be conducted during preparation of a Concept Formulation Package (Event A9). Identified requirements of SPAs (Skill Performance Aids), training devices, and training on mission critical/high risk tasks form the basis for the statement of training requirements incorporated into the AD (Advance Development) prototype contract (Event B1).

TRADOC Regulation 600-4 divides the preparation of an OICTP/ICTP into two major events, Preparation of a Draft ICTP (Event A7.1) and Preparation of a

Training Support Plan (Event A7.0). These two events take place concurrently and may be accomplished by the same personnel. For this reason this handbook treats these two events as a single event, Event A7.

TSM/AO Responsibilities

TRADOC proponent schools and activities are responsible for development of the OICTP and of the ICTP that follows. Other responsibilities of the training proponent, as well as those for other TRADOC and U. S. Army activities, are outlined in TRADOC Circular 351-8 (see especially Appendix B). An OICTP should be prepared in close cooperation with the materiel developer, logistics activities, and the Soldier Support Center and other MOS proponents.

Phasing

According to TRADOC Circular 351-8, the OICTP should be prepared prior to or concurrent with the LOA. The OICTP must be submitted to TRADOC (U. S. Army Training Support Center, USATSC) at the same time as the Letter of Agreement.

The OICTP must be updated continually throughout the Conceptual Phase to reflect the most recent revisions to the materiel concept and the findings of any special training studies that might have been conducted to identify a best training approach. If two or more training concepts are evaluated during the CTEA (Cost and Training Effectiveness Analysis, Event A9), the OICTP for the adopted training approach may need revision to handle problems uncovered during the CTEA.

A separate OICTP must be prepared for each alternative training concept still under active consideration at the time of LOA preparation.

INPUTS DATA/DATA BASE FOR EVENT A7

Core Data

A common core of data is used for all events leading up to and including preparation of the LOA (Event A5) and the OICTP. This data base is described

under Event A2, Personnel Investigation (see pp. III-4 to III-14). It includes (a) Mission Element Needs Statement (MENS), (b) Science and Technology Objectives Guide (STOG), (c) a description of the materiel concept, and (d) the mission profile for the system. The most recent revisions of these documents should be obtained.

Training Requirements Analysis Data

A considerable portion of the OICTP is based on data developed during Event A3, Training Requirements. Outputs from Event A3 include (a) a list of mission critical/high risk training tasks categorized by duty position, (b) identification of individual and collective training requirements for all system duty positions (c) identification of training device requirements, and (d) a summary of training modes/requirements for all duty positions. The forms completed during Event A3 containing the basic data for many of the training sub-paragraphs of the OICTP.

OUTPUTS AND END PRODUCTS FOR EVENT A7

Training Plans

An outline, accompanied by a summary description, of (a) Individual Training Plan(s), (b) Collective Training Plan(s), (c) Institutional Training Plan(s), (d) Unit Training Plan(s), and (e) Training Extension Course/ACCP Plan(s).

Training Documents and Technical Manuals

A summary of requirements for technical manuals for operator and maintenance duty positions, and a summary of the various documents that will have to be prepared or revised in support of training. These include Soldier's and Commander's manuals, SQTs and ARTEPs, and documents that are prepared under the Army training literature program (see TRADOC Circular 351-8 for a complete listing).

Training Equipment and Device Requirements

A summary of the training devices that will have to be developed and purchased; a summary of the additional units of operational equipment that will have to be purchased for training purposes. This information will be used in the BOIP for training devices and TDA.

Training Support Requirements

A summary of the instructors, facilities, ranges, ammunition, etc., that will have to be obtained in support of training.

Cost Estimates

An estimate of the overall cost per year, projected over a five-year span if possible, to support the training subsystem.

REFERENCES

- AR 71-5, Introduction of New or Modified Systems/Equipment (to be replaced by AR 350-XXX)
- TRADOC Circular 70-80-1, Training Device Development
- TRADOC Circular 350-3, Individual/Collective Training and Development Glossary (TBP)
- TRADOC Circular 351-3, Individual Training Plan (TBP)
- TRADOC Circular 351-4, Job and Task Analysis (TBP)
- TRADOC Circular 351-5, SQT Policy and Procedures
- TRADOC Circular 351-8, Individual and Collective Training Plan for Developing Systems; Policies and Procedures
- TRADOC Circular 351-XXX, Collective Training Plan (TBP)
- ARI-TR-78-A7, TSM Guide to Training Development and Acquisition of Major Systems
- Braby, R., Henry, J. M., Parrish, W. F., Jr., and Swope, W. M., A Technique for Choosing Cost-Effective Instructional Delivery Systems, TAEG Report No. 16, Department of the Navy, Training Analysis and Evaluation Group, Orlando, FL, April 1976.

EXAMPLES AND ILLUSTRATIONS

The OICTP/ICTP format instructions are shown in Figure III-17.

PROCEDURAL STRATEGY

During Phase I of the development cycle for a new system, data pertaining to the system may be very general or may even be missing. For this reason, it usually is not possible to develop detailed information upon which to base an OICTP. "Realizing this, the OICTP, as a minimum, should consist of the training strategy, the training concept, and the initial resource estimates envisioned for the system" (TRADOC Circular 351-8).

As noted during the discussion of Event A3, Training Requirements, most new systems are improved versions of existing systems. It is therefore possible for subject matter training experts, using information about training for comparable systems, to make quite accurate estimates of training requirements for a developing system. The absence of detailed information about a new system should not prevent the training proponent from making professional judgments about training requirements.

The information and estimates provided in an OICTP will be based in part on professional judgments. As development of the system proceeds, these estimates can be validated and refined on the basis of more specific and detailed data. An OICTP is an active document, continually undergoing revision and update. At a minimum the document should be revised/updated on an annual basis, with the revised OICTP reflecting the latest training concept.

Following DT/OT I, information should be available in enough detail so that a detailed version of the OICTP can be prepared. At this stage the document becomes an ICTP. The ICTP still is subject to revision/review on an annual basis. The revised ICTP should reflect the latest data from DT/OT II and/or DT/OT III (if scheduled).

ICTP FORMAT

C-1. References. Cite governing regulations and directives.

C-2. General.

a. Purpose. State the overall purpose of the ICTP.

b. Scope. Should briefly address institutional and unit training program and location, NET requirements, effects of any changes to system/equipment under development, input of contents to the Individual Training Plans (ITP) for affected MOS, action to trigger AR 611-1 submission if needed, separate actions required to implement the ICTP and state that the ICTP is a management and planning document based on best data available and subject to change.

c. Development. Should briefly state the approach to training that will be used in developing the training programs to support the system/equipment and the areas which have been subjected to special emphasis.

d. Revisions. State frequency of expected review and updates.

C-3. Description of equipment.

C-4. Training strategy. State the planned strategy by which the training is to be implemented; cover both institution and unit environment and means by which unit proficiency can be gained and maintained through training to support development and user testing and after the new equipment is deployed.

C-5. Assumptions. May be omitted where specific guidance has been provided.

C-6. Training concept. State the concept of how the training program for the equipment will be structured; i.e., operator/organizational level training to be conducted at the unit level; DS/GS level maintenance instruction to be accomplished at institutional level as add-on to established MOS course.

C-7. Details. Subparagraphs will detail specifics of logistics requirements, instructor personnel, facilities, and other support requirements needed to implement training on a continuing basis. Resource estimates should identify requirements at the key account level, and should be expressed in terms of one-time and recurring implications. Personnel should be expressed in terms of officers, enlisted and civilians (man-years and end-strength). Funds should be rounded to the nearest hundred dollars, e.g., \$8.1K, and programmed for as far into the future as practical. A detailed explanation of the type of data required by DA is contained in AR 71-5, Introduction of New or Modified Systems/Equipment, and its replacement, AR 350-XXX, New Equipment Training and Introduction. Headings should be as follows:

(page 1 of 2)

Figure III-17. Contents of an Individual and Collective
Training Plan (ICTP)

(From TRADOC Circular 351-8, Appendix C)

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-
- a. Task and objective schedule.
 - b. New equipment training (NET) requirements to include type of instruction, estimated spaces, time frame required and TDY and travel costs. Should also include an estimate of New Equipment Training Team (NETT) requirements.
 - c. Institutional courses of instruction involved (new and/or add-on).
 - d. Correspondence courses of instruction involved (new and/or add-on).
 - e. Requirements for instructor and support personnel changes. Should reflect both military and civilian manpower requirements and cost projections for a 5-year period, by year.
 - f. Facilities requirements (new or add-on).
 - g. Training equipment requirements and proposed distribution plan.
 - h. New funding requirements (see para e above, cost projections required for a 5-year period, by year).
 - i. Ammunition requirements, broken out by training phase, individual, institution and unit.
 - j. Training aids and instructional media requirements to include type and time frame/date required.
 - k. Training literature requirements.
 - l. Training device requirements.
 - m. Other support requirements needed to implement training on a continuing basis (POI, admin/billeting, office supplies, repair parts, expendables, etc.)
 - n. Doctrinal, maintenance, training or other publications/media requiring revision based on introduction of this equipment/system (ARTEP, SQT, SM, job aids, etc.).
 - o. Opposing force (OPFOR) training requirements.

C-8. Appendixes. Appendixes, lettered and titled by content, should be included as appropriate to furnish data in support of the above and to provide schedules shown in appendix d.

C-9. Submission. Proponents will submit ICTP based on provisions of paragraphs 6h and i. A system that has no training impact does not require an ICTP, however, written relief from the requirement must be obtained from USATSC, ATTN: ATTSC-DS.

(page 2 of 2)

Figure III-17 (Continued)

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DETAILED PROCEDURES FOR ACCOMPLISHING EVENT A7

Event A7 can be subdivided into 22 elements, as shown in Figure III-18. Each of these elements relates to the preparation of a paragraph or a subparagraph for an OICTP/ICTP. Each event element can be subdivided into a number of sub-elements or procedural steps. Table III-5 lists all the event elements and procedural steps for accomplishing Event A7. Each procedural step is described on the following pages. Figure III-16 describes the general contents of an ICTP.

A7.1 Plan Event Activities and Collect Data

OVERVIEW

PURPOSE. The development of an OICTP will involve many different people and organizational elements. The procedures described for this activity tell you how to prepare yourself and others for the development of an OICTP.

TSM/AO RESPONSIBILITIES. Typically, a person within the DTD is assigned the responsibility for coordinating the preparation of an OICTP/ICTP. That person is responsible for activities described under this event, A7, and for the required actions described in TRADOC Circular 351-8. In most instances the AO does not actually prepare OICTP material. Rather, the TSM/AO makes sure that suitable organizational elements of TRADOC and DARCOM are tasked to prepare appropriate paragraphs for the OICTP.

SOURCES OF ASSISTANCE. Assistance may be obtained from various organizational elements within the proponent school. In addition, organizational elements within DARCOM and TRADOC can be called upon for help. These sources are described more fully under activity A7.1.1.

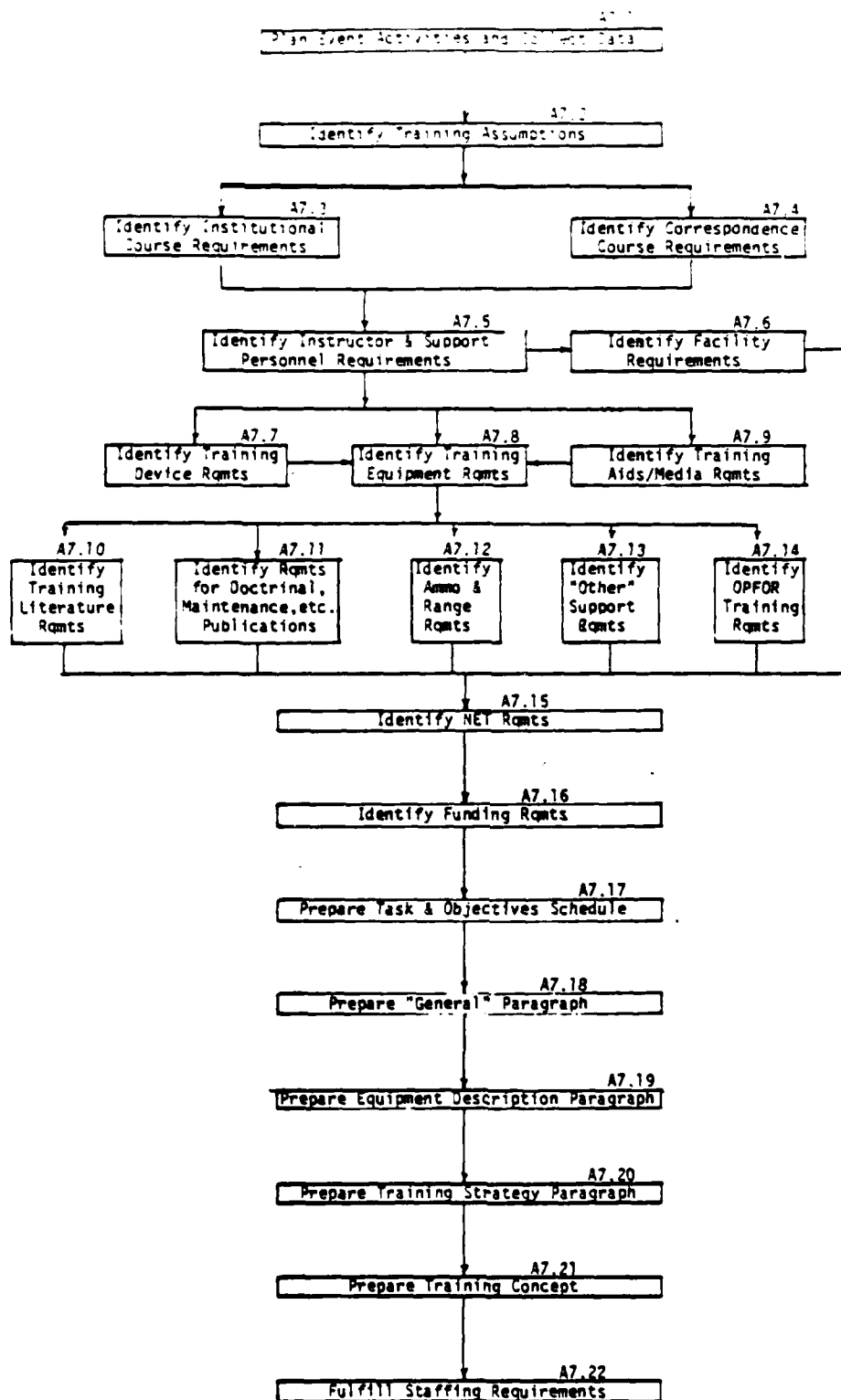


Figure III-1A. Diagram of Elements Comprising Event A7.
Outline Individual and Collective
Training Plan

Table III-5

ELEMENTS AND PROCEDURAL STEPS FOR EVENT A7,
OUTLINE INDIVIDUAL AND COLLECTIVE TRAINING PLAN

- A7.1 PLAN EVENT AND ACTIVITIES COLLECT DATA
 - 7.1.1 Identify Sources of Assistance
 - 7.1.2 Gather Background Data
 - 7.1.3 Gather Applicable Regulations, Directives, Letter, and Memoranda
 - 7.1.4 Identify Staffing/Coordination Requirements
 - 7.1.5 Prepare OICTP Development Schedule
 - 7.1.6 Obtain Training Requirements Analysis Data
- A7.2 IDENTIFY TRAINING ASSUMPTIONS
 - 7.2.1 Identify Potentially Important Assumption Areas
 - 7.2.2 Prepare Draft List of Assumptions
 - 7.2.3 Identify Additional Assumptions
 - 7.2.4 Prepare Consolidated List of Assumptions
- A7.3 IDENTIFY INSTITUTIONAL COURSE REQUIREMENTS
 - 7.3.1 Determine Requirement for New MOS
 - 7.3.2 Determine Need for New MOS-Producing Courses or Course Add-Ons
 - 7.3.3 Determine Need for Transition Training
 - 7.3.4 Identify Location of Resident Training
 - 7.3.5 Prepare Initial Summary of Institutional Training Requirements
 - 7.3.6 Obtain Inputs From Other Schools
 - 7.3.7 Summarize Institutional Training Requirements
- A7.4 IDENTIFY CORRESPONDENCE COURSE REQUIREMENTS
 - 7.4.1 Identify Requirements for Add-on Correspondence Courses
 - 7.4.2 Identify Requirements for New Correspondence Courses
 - 7.4.3 Summarize Correspondence Course Requirements
 - 7.4.4 Obtain Inputs from Other Schools
 - 7.4.5 Consolidate Inputs and Comments
- A7.5 IDENTIFY INSTRUCTOR AND SUPPORT PERSONNEL REQUIREMENTS
 - 7.5.1 Calculate Student Load
 - 7.5.2 Calculate Instructor Load
 - 7.5.3 Identify Support Personnel Requirements for New Courses
 - 7.5.4 Identify Instructor/Personnel Requirements for Add-on Courses
 - 7.5.5 Request Inputs From Other Schools
 - 7.5.6 Consolidate Inputs From All Schools
 - 7.5.7 Special Procedures for an OICTP

Table III-5 (continued)

A7.6 IDENTIFY FACILITY REQUIREMENTS

- 7.6.1 Identify Facility Requirements for New Courses
- 7.6.2 Identify Facility Requirements for Add-on Courses
- 7.6.3 Adjust Estimates to Reflect Anticipated Space Gains
- 7.6.4 Obtain Estimates From Other Schools
- 7.6.5 Consolidate Inputs From All Schools
- 7.6.6 Application to an OICTP

A7.7 IDENTIFY TRAINING DEVICE REQUIREMENTS

- 7.7.1 Obtain Data From Event A3
- 7.7.2 Review Training Device Requirements Data
- 7.7.3 Summarize Training Device Requirements for Each Job Position
- 7.7.4 Prepare OICTP Inputs in Draft Form
- 7.7.5 Obtain Inputs/Comments From Other Schools
- 7.7.6 Consolidate Inputs/Comments and Prepare Second Draft

A7.8 IDENTIFY TRAINING EQUIPMENT REQUIREMENTS

- 7.8.1 Review Requirements Identified During Event A3
- 7.8.2 Further Analysis of Training Equipment Requirements
- 7.8.3 Estimate Number of Equipments Required
- 7.8.4 Prepare Matrix of Estimated Requirements
- 7.8.5 Obtain Inputs/Comments From Other Schools
- 7.8.6 Consolidate Inputs/Comments From All Schools
- 7.8.7 Prepare OICTP/ICTP Sub-Paragraph
- 7.8.8 Application to an OICTP

A7.9 IDENTIFY TRAINING AIDS/MEDIA REQUIREMENTS

- 7.9.1 Identify Special Training Aid/Media Requirements
- 7.9.2 Summarize Requirements for OICTP

A7.10 IDENTIFY TRAINING LITERATURE REQUIREMENTS

- 7.10.1 Identify MOSs Involved
- 7.10.2 Identify Training Literature for Existing MOSs
- 7.10.3 Prepare Training Literature Requirement Estimates
- 7.10.4 Obtain Inputs From Other Schools
- 7.10.5 Consolidate Inputs From All Schools

A7.11 IDENTIFY REQUIREMENTS FOR DOCTRINAL, MAINTENANCE, ETC. PUBLICATIONS

- 7.11.1 Identify Publications to Consider
- 7.11.2 Develop Expanded Training Literature Requirements Matrix
- 7.11.3 Prepare Publication Requirement Estimates
- 7.11.4 Obtain Inputs From Other Schools
- 7.11.5 Consolidate Inputs From All Schools

TABLE III-5 (continued)

A7.12 IDENTIFY AMMUNITION AND RANGE REQUIREMENTS

- 7.12.1 Prepare Worksheet for Making Estimates
- 7.12.2 Identify Collective Training Requirements
- 7.12.3 Identify Ammunition and Range Requirements
- 7.12.4 Obtain Inputs From Other Schools
- 7.12.5 Consolidate Ammunition Requirements
- 7.12.6 Consolidate Range Requirements

A7.13 IDENTIFY "OTHER" SUPPORT REQUIREMENTS

A7.14 IDENTIFY OPFOR TRAINING REQUIREMENTS

A7.15 IDENTIFY NET REQUIREMENTS

- 7.15.1 Judge Applicability of NET Approach
- 7.15.2 Prepare Summary Statement of NET Requirements

A7.16 IDENTIFY FUNDING REQUIREMENTS

- 7.16.1 Obtain Estimated Per Unit Cost of System
- 7.16.2 Define Boundaries of Judgment Categories
- 7.16.3 Prepare New Funding Requirements Estimate Matrix
- 7.16.4 Obtain Funding Estimates
- 7.16.5 Adjust Funding Estimates
- 7.16.6 Prepare Sub-Paragraph for OICTP

A7.17 PREPARE TASK AND OBJECTIVES SCHEDULE

- 7.17.1 Develop Objectives Schedule
- 7.17.2 Develop Task Schedule
- 7.17.3 Prepare Consolidated Schedule for Training Objectives and Tasks

A7.18 PREPARE GENERAL PARAGRAPH OF OICTP/ICTP

- 7.18.1 Prepare Statement of Purpose
- 7.18.2 Prepare Statement of Scope
- 7.18.3 Prepare Development Sub-Paragraph
- 7.18.4 Prepare Revision Sub-Paragraph

A7.19 PREPARE EQUIPMENT DESCRIPTION PARAGRAPH

- 7.19.1 Obtain System Description from PM
- 7.19.2 Prepare Description Paragraph

A7.20 PREPARE TRAINING STRATEGY PARAGRAPH

- 7.20.1 Outline Training Implementation Strategy
- 7.20.2 Prepare NET Sub-Paragraph
- 7.20.3 Prepare Institutional Training Sub-Paragraph
- 7.20.4 Prepare Unit Training Sub-Paragraph

TABLE III-5 (continued)

A7.21 PREPARE TRAINING CONCEPT PARAGRAPH

- 7.21.1 Identify Topics to Cover in Training Concept Paragraph
- 7.21.2 Prepare Introductory Statement
- 7.21.3 Prepare Sub-Paragraph for SPA Material
- 7.21.4 Prepare Sub-Paragraph on Organization of the Training Program
- 7.21.5 Prepare Sub-Paragraph on Institutional Training
- 7.21.6 Prepare Sub-Paragraph on Unit Training
- 7.21.7 Prepare Total System Training Sub-Paragraph
- 7.21.8 Prepare Course Development Sub-Paragraph
- 7.21.9 Application to an OICTP

A7.22 FULFILL STAFFING REQUIREMENTS

- 7.22.1 Coordinate Draft OICTOP/ICTP
- 7.22.2 Revise OICTP/ICTP
- 7.22.3 Staff Revised OICTP/ICTP With PM and With HQ Training Proponent
- 7.22.4 Submit OICTP/ICTP to USATSC

PROCEDURES

A7.1.1 IDENTIFY SOURCES OF ASSISTANCE. Figure III-13 (page III-80), from TRADOC Circular 351-8, identifies the organizational elements that have primary and secondary responsibility for preparing an OICTP. Within the proponent school some organizational elements prepare OICTP material and other elements review this material. Similarly, various TRADOC and DARCOM elements prepare portions of the OICTP. These, plus other elements, review the OICTP once it has been prepared as a complete draft.

Within the proponent school the persons who performed Event A3, Training Requirements, are the main sources of assistance during OICTP preparation.

During development of the OICTP you will have numerous occasions to seek cost information. Identify persons within the school's comptroller office who can assist you in developing cost data. Also, the DTD and/or the Department of Evaluation (if one exists at your school) may have a cost control office. One or both of these offices may be able to provide information about the cost of training programs, cost of instruction and so on. Other possible sources include DARCOM, HQ TRADOC and COA.

Figure III-13 indicates a number of TRADOC agencies that provide inputs to an OICTP. Specifically, you should learn the names of your AO counterparts at the Soldier Support Center, the LOGCEN School and other MOS proponent schools and log oriented schools.

Certain portions of the OICTP are prepared by the materiel developer. You will have numerous occasions to contact your materiel developer counterpart. Establish contact with this person if you have not done so already.

Eventually you will submit the OICTP to the U. S. Army Training Support Center. USATSC will review the OICTP and, as appropriate, will request additions or deletions to the document. Early in the development of the OICTP, establish contact with the OICTP review office within USATSC. Personnel in this office are available to guide and assist you.

A7.1.2 GATHER BACKGROUND DATA. During the early portions of the Concept Phase the system concept may undergo considerable change. Before preparing the OICTP, obtain from the PM the latest description of the materiel concept.

During the Concept Phase, the view of how the system will be used in the operational setting also may undergo considerable change. This will be reflected in a revised mission profile for the system. Obtain the latest description of the mission profile from the combat developer.

Changes in materiel concept and/or mission profile may lead to changes in the manning concept for the system. From either the combat developer or the PM, obtain the latest information on (a) estimates of the number and types of persons required to operate/maintain the system; (b) estimates of MOS and skill level requirements; (c) estimates of required prerequisite abilities/aptitudes of operator and maintenance personnel. This information may be obtained from proponent school personnel who were responsible for Event A2, Personnel Investigations.

General guidance regarding personnel and training often is developed prior to the LOA and may even be addressed during preparation of the MENS. This information may include restrictions regarding personnel and the use of training devices. Before preparing an OICTP, make sure you have obtained the latest guidance/restrictions information on (a) numbers and types of personnel who can be used to man the system, (b) use of training resources, and (c) training strategy concept.

A7.1.3 GATHER APPLICABLE REGULATIONS, DIRECTIVES, LETTERS, AND MEMORANDA.

A number of regulations, directives, circulars, and military standards govern the development and implementation of an OICTP/ICTP. Those commonly cited in ICTPs are listed in Table III-6; items marked with an asterisk are of major importance. The titles of other references of possible interest can be identified by looking over the consolidated list of references in Appendix C of this handbook.

For any specific developing system, a number of letters and memoranda may contain guidance/approval information. The specific guidance or authorization for many of the statements in the OICTP may be available in such documents. They should be cited in the reference section of the OICTP/ICTP. Copies of this material can be obtained from DTD or DCD, or from the PM. In addition, the TSM office, if established, will have copies of this information.

A7.1.4 IDENTIFY STAFFING/COORDINATION REQUIREMENTS. TRADOC Circular 351-8 lists the responsibilities of the various TRADOC organizational elements concerned with OICTP preparation. This information plus information in the text of Circular 351-8 collectively describes the AO's staffing and coordination requirements.

Within the proponent school, staffing and coordination must be accomplished among appropriate members of the DTD, DCD, training device office, and those offices able to provide cost information. In particular, the document must be coordinated with and eventually approved by the office of the School Commandant.

Figure III-13 (page III-80) identifies the other organizational elements involved with an OICTP, and the nature of their involvement. Arrangements must be made for obtaining inputs from the Soldier Support Center, the LOGCEN, and the materiel developer. A variety of other agencies, including

Table III-6

LIST OF REFERENCES FOR OICTP/ICTP

AR 350-1	Army Training
*AR 350-35	Introduction of New or Modified Systems/Equipment
AR 571-2	Organization and Equipment Authorization Tables - Personnel
AR 700-18	Provisioning of U. S. Army Equipment
AR 700-127	Integrated Logistic Support
*DA PAM 11-25	Life Cycle System Management Model for Army Systems
DA PAM 570-558	Staffing Guide for U. S. Army Service Schools
TRADOC Regulation 70-1	Research and Development, New Equipment Training Requirements and Procedures
TRADOC Regulation 351-3	Resident Training Policy
TRADOC Regulation 700-1	Integrated Logistic Support
TRADOC Circular 350-3	Individual Collective Training and Development Glossary
TRADOC Circular 351-8	Individual and Collective Training Plans for Developing Systems - Policy and Procedures
TRADOC Circular 351-28	Soldier's Manuals, Commander's Manuals, and Job Books - Policy and Procedures
TRADOC Circular 351-5	SQT Policy and Procedures

the Soldier Support Center, and the TSM, must have an opportunity to review the document. As noted already, the USATSC reviews the draft OICTP. In addition, USATSC will act as the HQ TRADOC action office for coordinating the draft OICTP through other major Army elements that have an interest in the system.

A7.1.5 PREPARE OICTP DEVELOPMENT SCHEDULE. The OICTP must be submitted to USATSC along with the LOA. The master system development schedule, maintained by the PM, can be used to establish the target date for submission of the LOA. Preparation of the OICTP should begin at least four months before the date of submission to USATSC. The first two months are devoted to preparing the first draft of the document and obtaining inputs from other TRADOC elements and from DARCOM. The third month is used for reviewing the first draft. The fourth month is used for preparing a second draft of the document for submission to USATSC.

A7.1.6 OBTAIN TRAINING REQUIREMENTS ANALYSIS DATA. The data needed to prepare the OICTP are developed during Event A3, Training Requirements. Procedures for this event are described in this handbook under Event A3. The Event A3 outputs consist of a variety of forms that collectively contain the background information needed to prepare the sub-paragraphs of an OICTP/ICTP. If Event A3 has not yet been performed, it should be done at this time. Subsequent descriptions of how to prepare the subparagraphs of an OICTP are based on the assumption that the training requirements analysis as described under Event A3 has been accomplished.

A7.2 Identify Training Assumptions

OVERVIEW

PURPOSE. The plans and estimates contained in an OICTP are based on numerous assumptions. The more important of these assumptions are listed in paragraph 5 of the OICTP. This paragraph may be omitted where specific guidance has been provided.

TSM/AO RESPONSIBILITIES. The proponent school action officer is responsible for identifying and consolidating the assumptions upon which the OICTP is based.

SOURCES OF ASSISTANCE. Agencies that prepare inputs to the OICTP also are responsible for identifying the assumptions upon which their inputs are based.

PROCEDURES

A7.2.1 IDENTIFY POTENTIALLY IMPORTANT ASSUMPTION AREAS. Illustrations from existing ICTPs are shown in Figures III-19 and III-20. These illustrations contain some of the typical assumptions found in an OICTP/ICTP. Review the assumptions in these two figures and determine whether any similar assumptions apply to the system under consideration.

Review the training requirement analysis material developed during Event A3. Note whether any assumptions have been made about training devices, training equipment, or SPA material. Consult with the persons who help develop the training analysis material and determine any special assumptions upon which the training analysis was based. On the basis of this investigation, add to your list of assumptions as appropriate.

Review the letters and memoranda collected during Event A7.1.2 and note whether they contain special guidance or restrictions pertaining to training.

If so, determine whether these items of guidance/restrictions should be considered as assumptions during the development of the OICTP.

A7.2.2 PREPARE DRAFT LIST OF ASSUMPTIONS. On the basis of studies during A7.2.1, prepare a draft list of training assumptions. Compare this list with the lists in Figures III-19 and III-20 to judge whether important assumption areas have been omitted from the draft list.

5. Assumptions:

- a. Deployment of the RPV system will not exceed the training capability of USAFAS, or any other TRADOC service School.
 - b. Additional assets will be provided as programmed so that the deployment of RPV will not exceed the training capability of USAFAS, or any other TRADOC School
 - c. Milestone schedules for all events will be met or exceeded.
 - d. The Army Equipment for Training (AET) will be delivered on time and in sufficient quantity.
 - e. The contractor provided classroom program of instruction, Extension Training Materials (ETM) and lesson plans, training aids, and student guides, will be complete enough to allow USAFAS and TRADOC personnel to implement an institutional training POI for RPV operators, maintenance personnel, and officers with minimal modification.
 - f. Active Army AIM divisions will be authorized one RPV platoon each.
 - g. Instructor support requirements are based on active Army personnel sustainment requirements. (New equipment training requirements are not included.)
 - h. The proposed RPV system MOS will be approved.
 - i. Sufficient personnel will be available to receive contractor training courses and resident school training.
 - j. No DS/AVIM/GS personnel will be trained at Ft. Sill.
-

Figure III-19 List of Assumptions Contained in ICTP for
Petroleum Hoseline System

5. ASSUMPTIONS:

- a. That USAQMS proponent MOS's specified in the QQPRI, and reflected at Appendix D, for this equipment will not change prior to fielding.
 - b. That the skills of the MOS's prescribed herein will not change prior to the fielding of this equipment.
 - c. That maintenance levels specified in the maintenance allocation chart will not change significantly.
 - d. That NET will be conducted in accordance with the scope and time frames specified in this plan, AR 71-5, and DARCOM NET Plans.
 - e. That training equipment, devices, components and special tools and test equipment will be funded by DARCOM, and provided in quantities and within time frames specified within this plan.
 - f. That training literature and publications will be provided in quantities, and within time frames, specified within this plan.
 - g. That the developer's milestones will not change significantly.
 - h. That the Integrated Logistical Support (ILS) Concept will be applied throughout the life cycle of this developmental item.
 - i. That all USAQMS resource requirements will be met as scheduled.
-

Figure III-20 List of Assumptions Contained in ICTP for
Remotely Piloted Vehicle (RPV)

Staff to the draft list of assumptions with interested persons within your school. In general, this will include those persons who participated in Event A3 or who will be asked to take part in preparing the OICTP. They should include representatives from the Training Development Directorate, Combat Development Directorate, appropriate academic departments, and other appropriate elements of the school.

Prepare a revised list of assumptions based on comments obtained from persons within the proponent school.

A7.2.3 IDENTIFY ADDITIONAL ASSUMPTIONS. After a preliminary draft of the OICTP has been prepared, it is forwarded to the material developer, the Soldier Support Center school, the LOGCEN school and other interested schools. These agencies are requested to prepare subparagraphs for paragraph C.7 of the OICTP. Persons providing the inputs for these sub-paragraphs are asked to state the assumptions upon which the inputs are based, and to review the preliminary list of assumptions and suggest changes as appropriate.

A7.2.4 PREPARE CONSOLIDATED LIST OF ASSUMPTIONS. A final set of assumptions for the OICTP is prepared. It includes those assumptions agreed upon among all developers and reviewers of the draft OICTP. This list must include those assumptions identified by the PM, the Soldier Support Center, and the LOGCEN. The format for this list of assumptions is as shown in Figures III-19 and III-20.

A7.3 Identify Institutional Course Requirements

OVERVIEW

PURPOSE. During this activity you will identify the need for new MOS courses or for modifications of "add-ons" to existing courses. This material is summarized as sub-paragraph c of paragraph 7 of an OICTP/ICTP. It provides an overview of the changes that must be made in institutional training to support the development system.

TSM/AO RESPONSIBILITIES. The TSM/AO must identify and task appropriate persons to accomplish this activity. Also, the TSM/AO may find that he must consolidate inputs from these persons. The establishment of a Joint Working Group is one way to accomplish this activity.

SOURCES OF ASSISTANCE. The Directorate of Training Development is responsible for preparing this OICTP material. When a JWG is used, the group should include representatives from the academic department and course development.

PROCEDURES

A7.3.1 DETERMINE REQUIREMENT FOR NEW MOS. A decision to establish a new MOS-producing course is based on a determination that a new MOS is needed. Usually a new MOS is established when the duties and tasks for that MOS are substantially different from those for an existing MOS. One set of procedures for determining the need for a new MOS is as follows:

- a. Obtain the forms used to record the duties/tasks to be performed by each operator position for the new system. This information is recorded on Form A3.1.5, Identification of Operator Requirements (see activity A3.1.5, page III-26. In Column B of this form are recorded judgments about the similarity of each operator task to those duties/tasks performed by a comparable operator position. A separate form should have been prepared for each operator position.
- b. For each operator position determine about what percentage of tasks are "different" from the task requirements for the comparable position. This is done by calculating the percentage of "3" judgments listed in Column 3, Form A3.1.5.
- c. When 33% or more of the tasks are judged to be different, consider the establishment of a new MOS. When the number of dissimilar tasks is less than 33%, consider modifying or adding on to the existing MOS-producing course(s) used to train the "comparable" operator.
- d. A decision to establish a new MOS must be based on a variety of factors. A new MOS may be considered when it is anticipated that the prerequisite requirements or the career ladder for the new duty position(s) will be substantially different from existing positions. For some developing systems it may be appropriate to combine two MOSs into a new MOS. These decisions must be based on discussions between the training and combat developers.

- e. The persons involved with this activity must tentatively decide (1) to recommend the establishment of one or more new MOSs, or (2) to recommend that the new duty positions be subsumed under existing MOS(s).
- f. Repeat steps "a" through "e" for maintenance positions.

A7.3.2 DETERMINE NEED FOR NEW MOS-PRODUCING COURSES OR COURSE ADD-ONS.

During this activity determine whether a new MOS producing course is needed or whether a modification to or an add-on to an existing course will be sufficient.

If a decision has been made to establish a new MOS, that usually means a new MOS-producing course also must be established.

An add-on to an existing course can be implemented in a variety of ways.

The options include:

- a. Add to or modify existing blocks of instruction.
- b. Add a separate block of instruction at the end of the existing course.
- c. Develop a "cap" or "follow-on" course to the existing course.

A general procedure for selecting one of these options is described below:

- a. Form A3.4.1, Training Modes Analysis, indicates for each operator task whether that task is currently taught and, if so, where it is taught. All operator tasks which are not presently taught (Column B, Form A3.4.1) and for which a judgment has been made that they should be taught (Column C, Form A3.4.1) should be identified.
- b. For each task thus identified, determine whether there is a block of instruction within an existing course within which the task could be taught. This activity requires an analysis of existing courses. This should be performed by appropriate members of the academic department, using procedures as outlined in Block I.4 of the ISD process (see TRADOC Pamphlet 350-30).
- c. For each analyzed task, judge whether that task can be incorporated into an existing MOS course, added onto an existing course, or placed in a follow-on course. Guidance for making these decisions is as follows:
 - (1) Incorporate the new material into an existing course. When the existing course has a block of instruction closely related to the new material.

- (2) Add onto an existing course when the add-on material covers new topic areas that must be learned by all persons going through the course.
- (3) Incorporate new material into a follow-on or "cap" course when only certain students will be assigned to take the follow-on course.

A7.3.3 DETERMINE NEED FOR TRANSITION TRAINING. During the initial fielding of a system, special training may be provided to persons already trained to operate/maintain a comparable system. This training usually is provided by New Equipment Training Teams (NETT). However, institutional training may be necessary to support transition training. This need can be identified by examining the training requirements for the following periods in the system development cycle:

- a. OT I to OT II
- b. OT II to OT III (if an OT III is scheduled)
- c. OT II/OT III to IOC (initial introduction of system into the field)
- d. IOC to full scale implementation

The institutional training requirements identified during A7.3.2 apply to full scale implementation. They must be examined with respect to whether they will be needed and, if so, how they will be obtained prior to full scale implementation. For each requirement identified during A7.3.2:

- a. Estimate when the requirement must first be met: after OT I, after OT II, or after IOC.
- b. Identify the persons who must be trained: OT players, school staff, persons trained on other systems, etc.
- c. Identify the best training approach: New Equipment Training (NET), Key Personnel training course, initial version of institutional course, or final version of institutional course(s).

A7.3.4 IDENTIFY LOCATION OF RESIDENT TRAINING. During this activity you identify the schools that will be responsible for institutional training during the transition and fielding periods. In most instances those schools that are now conducting similar MOS-producing courses will be responsible for the new courses.

If a new course is proposed, the best location for the course must be considered. Usually it is the school that already is presenting a somewhat similar course.

A7.3.5 PREPARE INITIAL SUMMARY OF INSTITUTIONAL TRAINING REQUIREMENTS. Institutional training requirements are summarized in sub-paragraph 7.3 of the OICTP/ICTP. An outline of the topics to include in this sub-paragraph follows:

7.c Institutional Training (Figure III-121)

- (1) Transitional Training
- (2) Sustaining Training
 - (a) Operator Training
 - 1 1st school
 - 2 2nd school
 - (b) Maintenance Training
 - 1 1st school
 - 2 2nd school
 - (c) Unit Training

The various parts of sub-paragraph 7.c should contain the following information.

- a. Institutional Training. A brief summary of institutional training requirements.

7.c INSTITUTIONAL TRAINING: Institutional training will be conducted for all DA operational and maintenance personnel as stated below. This training will be designated for support of production RPV systems and will be based on the results of DT/OT II evaluation of operational and maintenance training courses conducted during the FSED phase. Since the DT/OT II courses will be validated and approved by the appropriate TRADOC schools/centers; they should require minimal restructuring to support the institutional training requirement.

(1) Transitional Training. The contractor will provide training for OT I players. USAFAS will provide test player training for OT II. During the production and deployment phase USAFAS will conduct both individual and collective training (packet training) in order to field fully trained units which will be able to perform their assigned mission within a minimum amount of time after deployment. This training will be provided by improved programs developed for DT/OT III. The training will be comprised of formal classroom instruction, lab/hardstand exercises, GCS simulator, crew drill and actual flight.

(2) Sustaining Training. During the sustainment phase USAFAS will conduct all individual skill level 1 training for operator and organizational maintenance for the RPV MOS. DS/Gs maintenance personnel will be trained by the proponent MOS-producing schools. Collective training will be conducted at the unit level.

(a) Operator Training. Three new MOS-producing courses for RPV operator and organizational maintenance repairman will be developed.

- 1 USA Field Artillery School. All operator and organizational maintenance courses will be conducted at USAFAS.
- a MOS 13XX - RPV Operator. A new 12 week course that will teach the operation of the RPV.
- b MOS 13XX ASI - RPV Organizational Maintenance Repairman. A new 3 week course designed to teach organizational maintenance of the RPV.

(b) Maintenance Training. Existing maintenance courses at three schools will be used in support of the RPV System.

- 1 USA Engineer School. Three engineer MOSs will be used in support of the RPV.
- a MOS 52C - Utilities Equipment Repairer. The current program for MOS 52C is sufficient to enable them to perform their duties on the standard air-conditioning equipment in the RPC unit.
- b MOS 35E - Special Electronic Device Repairer. The concept of training for MOS 35E will be the current MOS training program plus Extension Training Material (ETM) for the RPV-peculiar equipment the 35E will support.
- c Unit Training. Training of unit personnel will be accomplished at unit level, guided by revised ARTEP 6-307.

Figure III-21 Illustration of Contents of Institutional Training
Sub-Paragraph (7.c) of an OICTP/ICTP (From ICTP for RPV)

- b. Transitional Training. One or more summary statements of institutional training requirements for the following periods: OT I to OT II; OT II to OT III (if OT III is scheduled); OT II/III to IOC; and IOC to full scale implementation.
- c. Sustaining Training. A brief summary of how sustaining training will be accomplished.
- d. Operator Training. A statement summarizing operator training requirements. Under Operator Training list each school that has an institutional requirement for operator training.
- e. 1st School. A list of the MOS-producing courses for which the school is responsible. For each course provide this information: duty position title; whether the course is new or an add-on; the course length, if a new course; the number of days the course has been lengthened, if an add-on; course objectives.
- f. 2nd School. Same information as described for "1st School".
- g. Maintenance Training. Repeat steps "d", "e", and "f" for institutional maintenance training requirements.
- h. Unit Training. Note whether unit training is to be conducted at the unit level or at an institution. If at an institution, repeat steps "d", "e", and "f" above for the institutions involved.

A7.3.6 OBTAIN INPUTS FROM OTHER SCHOOLS. The summary prepared during A7.3.5 may include schools other than your own. In some instances DTD personnel at your school may be able to estimate the requirements for new or revised courses at other schools. Even if this happens, estimates for other schools must be considered tentative until corroborated by DTD personnel at those schools.

Following completion of A7.3.5, forward the summary information to all interested schools with a request to verify and revise, as needed, the information prepared for their school. Contact the AO at each school and find out whether he wants a copy of the Form A3.1.4 (Identification of System Components and Assemblies) used to prepare the institutional requirement estimates. If information about courses at other schools is developed completely at those schools, send each school a set of A3.1.5 and A3.1.6 forms with general instructions for using these forms for determining training requirements.

This activity should be accomplished concurrent with activity A7.4.4, Obtain Inputs From Other Schools (Correspondence Course Requirements).

A7.3.7 SUMMARIZE INSTITUTIONAL TRAINING REQUIREMENTS. On the basis of inputs, comments, and suggestions obtained during activity A7.3.6, prepare a final version of sub-paragraph 7.3 of the OICTP/ICTP.

A7.4 Identify Correspondence Course Requirements

OVERVIEW

PURPOSE. The training needs associated with some jobs/duties vary so widely, in terms of when and where needs arise, that job training material should be developed in more than one form. The need for self-study material in the form of correspondence courses is identified during this activity.

TSM/AO RESPONSIBILITIES. The TSM/AO assures that this activity is accomplished by tasking appropriate persons within the proponent school.

SOURCES OF ASSISTANCE. Assistance can be obtained from the DTD and the academic departments of the proponent school. When more than one school is involved, the AO at those schools must be contacted and inputs requested from those schools.

PROCEDURES

A7.4.1 IDENTIFY REQUIREMENTS FOR ADD-ON CORRESPONDENCE COURSES. During Event A3.4.1, Form A3.4.1 (Training Modes Analysis) was used to identify tasks that are or can be taught at a non-resident location. Using this form, the requirements for correspondence training for operators and for maintenance personnel can be established. Proceed as follows:

- a. Identify those tasks which are currently taught (Column B), which are adequately taught (Column E), and which are taught in a non-resident mode (Column D).

- b. For each of the identified tasks, determine whether they are now taught in a correspondence course. If they are, identify the course and the proponent school.
- c. Assume that the present correspondence course will be revised to cover tasks related to the new system.

A7.4.2 IDENTIFY REQUIREMENT FOR NEW CORRESPONDENCE COURSES. During

Activity A7.3 the need for new MOS-producing courses was identified. In this activity, A7.4.2, determine for each new MOS course whether a counterpart correspondence course is needed. A new correspondence course can be considered when:

- a. Training must sometimes be done at the unit level.
- b. Training must be accomplished while the trainee is in a duty status.
- c. The training does not require close supervision.
- d. Everything required for the training is available at the unit level, or can be incorporated into the training package.
- e. Personnel newly assigned to the unit are not required to perform the task(s).
- f. Practice is not the primary factor in performance of the physical skills involved.
- g. Self-study is required as a prerequisite for institutional training.

It can be assumed that the school which prepares an MOS-producing institutional course also will prepare any required correspondence course material.

A7.4.3 SUMMARIZE CORRESPONDENCE COURSE REQUIREMENTS. Use the same procedures and format to summarize these requirements that was used to summarize requirements for institutional training in A7.3.

A7.4.4 OBTAIN INPUTS FROM OTHER SCHOOLS. This activity is comparable to A7.3.6 and should be accomplished concurrent with that activity.

A7.4.5 CONSOLIDATE INPUTS AND COMMENTS. This activity is comparable to A7.3.7.

A7.5 Identify Instructor and Support Personnel Requirements

OVERVIEW

PURPOSE. A requirement for new or add-on courses means that additional instructors and support personnel must be obtained. In this activity gross estimates are made of these requirements.

TSM/AO RESPONSIBILITIES. The AO is responsible for coordinating the activity and for combining inputs from various sources. The DTD of the proponent school is responsible for preparing the actual estimates.

SOURCES OF ASSISTANCE. Assistance can be obtained from the DTD and academic departments. If more than one school is involved, an AO at those other schools is responsible for obtaining appropriate inputs.

PROCEDURES

A7.5.1 CALCULATE STUDENT LOAD. Obtain the equipment production schedule from the PM. Using this production schedule and the manning concept for the system:

- a. Determine the number of students required to support full system implementation. This is an estimate of the number of operators and technicians who must be trained per year to sustain system operation Army-wide.
- b. Determine the number of students needed in years prior to Initial Operational Capability (IOC). This estimate is based on the number of systems to be purchased for OT II and OT III (if applicable).
- c. Determine the number of students needed in the years between IOC and full implementation of the system Army-wide. This number depends primarily on the rate at which systems will be purchased following IOC.
- d. Prepare a table that shows, for each fiscal year following OT II, the number of operator and maintenance personnel who must be trained for the next five years.

A7.5.2 CALCULATE INSTRUCTOR LOAD. For each MOS-producing course identified during activity A7.3, determine the typical student-instructor ratio type of course. This information can be obtained from the appropriate academic departments. Using this information and the student load table prepared during A7.5.1:

- a. For each course, identify instructor requirements by grade for sustainment training (training in support of Army-wide implementation.)
- b. Determine instructor requirements by grade for transition training (period between OT II and full-scale implementation of system).
- c. Prepare a table showing instructor requirements by school, by grade, and by fiscal year. Project requirements out to the year of full implementation of system. (See example in Figure III-22.)

A7.5.3 IDENTIFY SUPPORT PERSONNEL REQUIREMENTS FOR NEW COURSES. For each MOS-producing course identified during activity A7.3, determine the typical personnel support requirements for that type of course. This information can be obtained from the academic department of the proponent school. Request the following information:

- a. The types of persons (i.e., managers, equipment custodians, secretaries, etc.) required to support each course. Both military and civilian personnel requirements must be identified.
- b. The guidance and/or rules followed by the proponent school for calculating support personnel requirements for various types of courses and various student-instructor loads/ratios.

On the basis of this information, calculate personnel requirements, using the general procedures described in Activity A7.5.2 for calculating instructor requirements. Summarize these requirements in tabular form (See example in Figure III-22.) Note that personnel requirements need not specify the type of person(s) required.

A7.5.4 IDENTIFY INSTRUCTOR/PERSONNEL REQUIREMENTS FOR ADD-ON COURSES. Repeat activities A7.5.2 and A7.5.3 for all add-on courses. Determine whether additional instructors must be obtained to handle the lengthened courses.

7.c INSTRUCTOR AND SUPPORT PERSONNEL REQUIREMENTS

(1) USAFAR

a. Instructor Personnel

<u>GRADE</u>	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>	<u>FY85</u>	<u>FY86</u>
O4	-	-	1	1	1
GS9	-	-	2	2	2
WO	-	-	2	2	2
E8	-	-	1	1	1
E7	4	4	2	2	2
E6	-	-	3	5	8
E5	-	-	1	3	5
E4	-	-	1	3	5

b. Support Personnel

<u>GRADE</u>	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>	<u>FY85</u>	<u>FY86</u>
O3	2	2	1	1	1
GS11	1	1	1	1	1
GS9	2	-	-	-	-
E7	1	1	1	1	1
E6	3	3	4	4	4
E5	-	-	1	1	2
E4	-	-	-	1	2
E3	-	-	-	1	2

Figure III-22 Illustration of a OICTP/ICTP Summary
of Instructor and Support Personnel Requirements

A7.5.5 REQUEST INPUTS FROM OTHER SCHOOLS. Each school scheduled for a new MOS-producing course or an add-on course must estimate instructor and support personnel requirements for their respective courses. This includes all new and add-on courses listed under sub-paragraph 7.c of the OICTP. The AO at the proponent school must request this information from each school listed in sub-paragraph 7.c. Procedures for generating this information are as described for activities A7.5.1 through A7.5.4.

A7.5.6 CONSOLIDATE INPUTS FROM ALL SCHOOLS. The AO at the proponent school consolidates personnel requirements into a tabular format such as that shown in Figure III-23. When six or fewer courses are involved, personnel requirements can be detailed in the body of the OICTP/ICTP. When a large number of courses and schools are involved in supporting the new system, training personnel requirements should be summarized in the body of the OICTP/ICTP and detailed in an appendix.

A7.5.7 SPECIAL PROCEDURES FOR AN OICTP. At the time OICTP is prepared, it seldom is possible to estimate accurately the requirements for instructors and support personnel. However, gross estimates are possible. As an illustration, personnel requirements can be estimated by numerical ranges: 0-1, 2-4, 5-9, 10 or more.

An ICTP contains estimates of personnel requirements by specific grade: O4, GS9, and so on. In an OICTP these estimates can be grouped by grade category: officer, civilian (GS), and enlisted (EM). Figure II-23 illustrates how instructor and support personnel estimates can be presented in an OICTP. The estimates are organized by school, by fiscal year, by general type of personnel (instructor or support), and by grade.

7.c INSTRUCTOR AND SUPPORT PERSONNEL REQUIREMENTS

(1) USAFAS

a. Instructor Personnel

<u>GRADE</u>	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>	<u>FY85</u>	<u>FY86</u>
Officer	-	-	2-4	2-4	2-4
GS	0-1	0-1	2-4	2-4	2-4
EM	-	2-4	5-9	10+	10+

b. Support Personnel

<u>GRADE</u>	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>	<u>FY85</u>	<u>FY86</u>
Officer	-	-	0-1	0-1	0-1
GS	-	0-1	2-4	2-4	2-4
EM	0-1	0-1	2-4	5-9	5-9

Figure III-23 Illustration of a Personnel Requirements
Table for an OICTP

A7.6 Identify Facility Requirements

OVERVIEW

PURPOSE. Estimating the requirements for new facilities at the time an OICTP is prepared is difficult. However, it takes at least five years to obtain new school buildings and other facilities, so an initial estimate of the requirement must be made as early as possible. The following procedures provide guidance for making these estimates.

TSM/AO RESPONSIBILITIES. The estimates are made by the DTD of the schools that will provide institutional support for the system. The AO at the proponent school is responsible for obtaining these estimates, for incorporating them into the OICTP, and for staffing up to the estimates.

SOURCES OF ASSISTANCE. Assistance can be obtained from the DTD and academic departments. If more than one school is involved, an AO at those other schools is responsible for obtaining appropriate inputs.

PROCEDURES

A7.6.1 IDENTIFY FACILITY REQUIREMENTS FOR NEW COURSES. The DTD at the proponent school is tasked with estimating facility requirements for new courses. For each new course the need for the following types of space should be determined:

- a. Classroom space
- b. Shop space (lab space)
- c. Administration space
- d. Storage

The estimates are based on space requirements of comparable courses, student load, and lab/shop training plans. In general, classroom space and office space

requirements can be estimated on the basis of student load. Lab space requirements depend on such factors as equipment size and ratio of students to sets of training equipment.

Estimates should be expressed to the nearest 100 square feet and should indicate the month and year by which the facilities ought to be available.

A7.6.2 IDENTIFY FACILITY REQUIREMENTS FOR ADD-ON COURSES. Adding one or two days of training to a course seldom creates a requirement for additional facilities. However, adding one or two weeks of additional training may require additional space, especially when the add-on training is in the form of practical exercises using all or portions of the new system.

Using the general procedures described in A7.6.1, estimate the facility requirements for each add-on course.

A7.6.3 ADJUST ESTIMATES TO REFLECT ANTICIPATED SPACE GAINS. At most schools courses are added or dropped from time to time, and the dropping of a course frees space for a new course. The estimate developed during A7.6.1 and A7.6.2, which are "additional" requirements, should be adjusted downward to reflect any space that would be gained through discontinuance of one or more courses.

The academic department that will present a new course should be asked to identify any space that will become available in later years. Also, someone within the school's comptroller office may be able to advise you regarding the availability of space in the future.

A7.6.4 OBTAIN ESTIMATES FROM OTHER SCHOOLS. All schools that will prepare new or add-on courses will be tasked to provide estimates of facility requirements. The procedures described for A7.5.5 should be followed.

A7.6.5 CONSOLIDATE INPUTS FROM ALL SCHOOLS. Inputs from various schools should be presented as separate line items in the OICTP/ICTP. Figure III-24 illustrates how this information can be presented.

7.f FACILITY REQUIREMENTS

- (1) USAFACFS - Approximately 27,300 sq ft of floor space will be required to conduct training. USAFACFS facility engineers have submitted an MCA construction project to TRADOC. The submitted project will be of adequate size to house the RPV system equipment and training devices and provide classroom, office, and storage areas. Expected completion date of building is December 1983.
 - (2) USAES - TBD
 - (3) USATSCH - For AVIM maintenance course 3000 sq ft of floor space are required for classroom, administrative offices and shop space to support MDS training.
-

Figure III-24 Illustration of OICTP/ICTP Description of Facility Requirements (From ICTP for RPV)

The need for new facilities may vary depending on the implementation stage of the training program. For example, the training program for the TACFIRE system will be implemented in four phases. In the TACFIRE ICTP, facility requirements for each of these four phases are detailed in an appendix.

A7.6.6 APPLICATION TO AN OICTP. Estimating facility requirements at the time when an OICTP must be prepared may be difficult. However, if it appears that extensive new facilities will be required, an effort must be made to develop estimates as early as possible. Otherwise, implementation of the training plan may be delayed.

It is possible to make useful estimates of facility requirements for an OICTP. The general procedures for doing this are as follows:

- a. For each new and add-on course at the present school, complete the matrix below by using professional judgments from members of the academic department. The judgments should be made in terms of the maximum anticipated student load (see A7.5.1 for procedures for making student load estimates).

<u>Space Rqmts</u>	<u>None</u>	<u>1 - 1000</u>	<u>1001-3000</u>	<u>3001-6000</u>	<u>6000-10,000</u>
Classroom	_____	_____	_____	_____	_____
Lab	_____	_____	_____	_____	_____
Shop	_____	_____	_____	_____	_____
Office	_____	_____	_____	_____	_____
Storage	_____	_____	_____	_____	_____

- b. Request other schools to complete a similar matrix for each new add-on course under their jurisdiction.
- c. Adjust initial estimates downward to reflect plans for discontinuing courses or other activities that may free space for the new courses.
- d. Consolidate requirements for each school by summing the end point for each range of space requirements. For example, in the illustration under "a" above the total space requirement is an estimated 7000 square feet.

A7.7 Identify Training Device Requirements

OVERVIEW

PURPOSE. Training devices such as mock-up and simulators may be used extensively for operator and maintenance training. In some instances several years are needed to design and produce these devices. Therefore, it is imperative that the requirement for such devices be identified early in the system development cycle. This will ensure that plans are made to obtain the devices and that funds are dedicated for this purpose.

TSM/AO RESPONSIBILITIES. The TSM/AO obtains the training requirements data generated during Event A3, summarizes them, and incorporates the data into the OICTP.

SOURCES OF ASSISTANCE. Assistance may be obtained from the persons who identified training device requirements during activity A3.5.1, Identify Training Device Requirements (Page III-42).

PROCEDURES

A7.7.1 OBTAIN DATA FROM EVENT A3. Training device requirements were identified during activity A3.5.1. Form A3.5.1, Training Device Requirements Work Sheet, was used for the initial analysis, and the findings were summarized on Form A3.9.1. A summary form was prepared for each operator and maintenance position. Identify the persons in DTD who participated in these activities and obtain copies of the forms.

An analysis was also made of the need for embedded testing (A3.6, Page III-45) embedded training (A3.7, Page III-46), and embedded simulation (A3.8, Page III-50). Statements summarizing these findings should be obtained from the DTD personnel who conducted the analyses.

If Activities A3.5 through A3.9 have not been performed, plans should be made to complete these activities before proceeding further with Event A7.7.

A7.7.2 REVIEW TRAINING DEVICE REQUIREMENTS DATA. The concept of the developing system may have undergone major revision since the initial analysis of training device requirements. Determine whether this is the case by consulting with the PM and with the DTD representatives involved in the initial training device analysis. If the concept has been revised, the data and judgements in Form A3.5.1 should be reviewed to determine whether the entries are still valid in light of the changes. The entries should be modified as appropriate, using the same procedures used during the initial analysis of training device needs. See activity A3.5.1 for a description of these procedures.

A7.7.3 SUMMARIZE TRAINING DEVICE REQUIREMENTS FOR EACH JOB POSITION. Form

A3.9.1 summarizes the training device requirements for each operator and maintenance position. These sheets contain judgments about the most appropriate training device for each major task to be performed by a particular duty position. In this activity, A7.7.3, this information is summarized further to identify, for each duty position, one or two training devices that will handle most of the training device requirements. The procedures for doing this are as follows:

- a. Review Column A of Form A3.9.1 and identify the most commonly listed training device for each position.
- b. Review Column A of Form A3.1.1 and identify the second most commonly listed training device for each position.
- c. Compare entries identified in "b" above with information contained in Form A3.5.1. Identify those tasks that have the training device identified in "a" above listed as the 2nd choice (Column I) in Form A3.5.1.
- d. When about 75% or more of the tasks for a particular position can be supported by one training device (1st or second choice as indicated in Columns H and I, Form A3.5.1), recommend only that device.
- e. When 25% or more of the tasks remain unsupported by a training device after "d" has been accomplished, consider recommending the second most commonly listed device, as determined in "b" above.
- f. If a large number of tasks still remain unsupported by a training device, consider the use of an actual equipment trainer.
- g. For each training device tentatively identified as required, develop the following information:
 - (1) Type of device. You already have this information; it will be something like mock-up or simulator.
 - (2) The type of learning to be supported by the trainer. This can be determined by summarizing the information in Column C of Form A3.1.1.

- (3) Portion of system to which training is relating. This can be determined by comparing task reference numbers with sub-system and major component names. Form A3.1.5 can be used for this. For each training device you want to be able to make the following types of statements:

- o "Device A supports operator training on the radar set console".
- o "Device B supports maintenance training in the driver's compartment".

A7.7.4 PREPARE OICTP INPUTS IN DRAFT FORM. Prepare a list of training device requirements by duty position. For each device provide a brief statement describing the type of device, the type of learning supported, and the portion of the system that is related to the device. A format for this information is shown in Figure III-25.

A7.7.5 OBTAIN INPUTS/COMMENTS FROM OTHER SCHOOLS. Under sub-paragraph 7.c o: the OICTP/ICTP is a list of all the schools involved with training in support of the new system. The draft list of training device requirements must be reviewed by each of these schools. Each school is requested to:

- a. Review the estimated requirements for those courses to be conducted at their school.
- b. Recommend revisions to the requirements as appropriate.
- c. Provide a rationale for any suggested revisions.

In some instances a course may be conducted solely at a school other than the proponent school. In such instances this "other" school can be asked to identify the training device requirements for courses solely under their jurisdiction. These schools should be sent a complete set of Forms A3.5.1 and A3.9.1.

A7.7.6 CONSOLIDATE INPUTS/COMMENTS AND PREPARE SECOND DRAFT. The AO is responsible for obtaining inputs and comments from all interested schools and for incorporating these inputs into a format such as that shown in Figure III-25.

1. TRAINING DEVICE REQUIREMENTS:

(1) Data derived from Logistics Support Analysis/Front End Analysis (LSA/FEA). The contractor will conduct training aids and devices studies and prepare and submit study reports. Revisions required will address all modifications/changes to the system hardware affecting the training device program. Particular attention will be directed toward any modification/changes to the Ground Control Station (GCS). Modifications/changes as they affect training devices shall be addressed during program design reviews for that equipment.

(2) Resident and field proficiency operation and maintenance training will need training simulation equipment, suitable for use in unit-level individual and collective operation and maintenance training, as an integral part of the RPV system equipment. Software in these devices shall be operated on the basis of user commands. Training aids and devices to be tested during OT II are:

(a) Training simulator, programmable by unit personnel, embedded or integrated into the GCS to simulate RPV reconnaissance and target acquisition missions, including video and data displays.

(b) Simulator computer programs for training in RPV mission input, flight control, navigation, sensor control, and data interpretation activities without requiring actual flight.

(c) Inert AIR vehicle for training in assembly, disassembly, testing, launch and recovery activities, without requiring actual flight. This device, programmable by unit personnel shall simulate operation of flight equipment and equipment fault troubleshooting.

(3) The contractor will also investigate and identify, in the training device study, the need for any additional training devices not specified above, such as classroom training devices or collective training devices.

Figure III-25. Illustration of a Description of Training Device Requirements (From ICTP for RPV)

A7.8 Identify Training Equipment Requirements

OVERVIEW

PURPOSE. In many instances training is supported by all or portions of the actual system. In practice this means that additional sets, subsystems, or components of the system must be purchased for training. This can have a major impact on the cost of the training system, and therefore must be identified as early as possible in the system development cycle.

TSM/AO RESPONSIBILITIES. The initial identification of training equipment requirements is made during activities A3.6 (Page III-45 and A3.9 (Page III-52). The AO for this activity, A7.8, is responsible for obtaining and consolidating inputs from the various persons and schools that participated in activities A3.6 and A3.9.

SOURCES OF ASSISTANCE. The people actually tasked to accomplish this activity are those already tasked to do activities A7.3 through A7.7.

PROCEDURES

A7.8.1 REVIEW REQUIREMENTS IDENTIFIED DURING EVENT A3. Forms A3.5.1 and A3.9.1, the training device detailed and summary forms completed during activities A3.5.1 and A3.9.1 respectively, contain judgments regarding the need for actual equipment for training. Obtain copies of these forms and review them. For each operator and maintenance position, summarize comments pertaining to the need for actual equipment for training. Concentrate on comments that suggest the need for a complete system or a complete subsystem.

A7.8.2 FURTHER ANALYSIS OF TRAINING EQUIPMENT REQUIREMENTS. As a follow-up to A7.8.1, review each operator and maintenance position and judge whether the training devices identified during activity A7.7 will adequately support

training. Using knowledgeable persons from DTD, CRSD, or the academic department, estimate the need for actual equipment trainers to supplement or to be used in place of training devices. These estimates are based on a gross comparability analysis. Essentially, SMEs familiar with the use of actual equipment for training in comparable systems judge the probable effectiveness of actual equipment for training on the new system. The estimates are for complete subsystems or complete systems. Estimates of the need for system components need not be made for an OICTP.

A7.8.3 ESTIMATE NUMBER OF EQUIPMENTS REQUIRED. Estimates of the number of equipments needed are based on estimated student load over a five-year period. Student load estimates were made during Activity A7.5.1. Obtain these estimates if they are available.

The amount of equipment required for training is based in part on an estimate of the equipment/student ratio required for effective training. Your school will have developed these ratios for existing programs. The DTD can establish these ratios for the whole system and for each major subsystem.

A7.8.4 PREPARE MATRIX OF ESTIMATED REQUIREMENTS. Using the information developed so far, estimate the amount of training equipment required for each operator and maintenance course, by fiscal year and by location. The format shown in Figure III-26 is suitable for this purpose. The number of systems or subsystems required each fiscal year is calculated by relating anticipated student load to student/equipment ratios. For example, if 50 operators will be trained in FY 85, and a suitable student/equipment ratio for an entire system is 25 to 1, then two full sets of equipment are needed to support operator training in FY 85.

A7.8.5 OBTAIN INPUTS/COMMENTS FROM OTHER SCHOOLS. Forward the matrix prepared during activity A7.8.4 to all schools that will conduct an MOS-producing course for the system. Other information to be sent to these schools includes the forms containing training device requirements information (Forms A3.5.1 and A3.9.1) and the summary of training device requirements prepared for the OICTP (if available). Request each school to review the requirements for those courses to be conducted at their installation. When a course is to be solely conducted at another school, the proponent school can request that school to prepare the initial estimates of training equipment requirements.

A7.8.6 CONSOLIDATE INPUTS/COMMENTS FROM ALL SCHOOLS. Update the matrix of estimated requirements developed during A7.8.4. This table is attached as an appendix to the OICTP/ICTP.

A7.8.7 PREPARE OICTP/ICTP SUB-PARAGRAPH. This sub-paragraph has a format as shown in Figure III-26. The requirements are organized by school and show the maximum amount of equipment needed to support the system after it has been completely fielded. This information reflects the proposed BOIP for the training equipment.

A7.8.8 APPLICATION TO AN OICTP. At the time the OICTP is prepared, information about student loads may not be available. Therefore, it is permissible, on the OICTP, to delete information on the number of equipments required. At the least, an OICTP should indicate whether actual equipment for training will be required, and whether the estimates are for complete sets of equipment, complete sets of subsystems, or both.

A7.9 Identify Training Aids/Media Requirements

OVERVIEW

PURPOSE. Many operator and maintenance courses use a variety of training aids and media. Eventually the requirements for these aids/media must be iden-

tified by school and by course. For an OICTP you need estimate only unusual requirements. These estimates are obtained from DTD with the assistance of appropriate academic departments.

TSM/AO RESPONSIBILITIES. The AO is responsible for obtaining and consolidating inputs from the proponent school and all other schools responsible for new or add-on courses.

SOURCES OF ASSISTANCE. Information on the types of aids/media to consider can be found in the DARCOM-TRADOC Training Acquisition Handbook and in TRADOC Pamphlet 350-30, Vol III.

PROCEDURES

A7.9.1 IDENTIFY SPECIAL TRAINING AID/MEDIA REQUIREMENTS. The types of aids and media commonly used during resident training are summarized in Figure III-27. Training devices and simulators already have been considered during activity A7.7. The need for training equipment (actual objects) was considered during activity A7.8. The need for computer mediated instruction was considered during Activity A7.7. During this activity, A7.1.1, you are concerned with training aids (standard aids), printed materials, audiovisual material, and teaching machines (D.1 of Figure III-27).

Convene a Joint Working Group comprised of representatives from DTD and the academic department, persons who have participated in prior activities related to the developing system. Ask them to review the tasks allotted to each operator and maintenance position and judge whether there may be an unusual need for certain training aids or media. Form A3.11.1 (Summary of Training Mode Requirements) can be used as a basis for this review. This form contains a sum-

mary of the tasks assigned to each duty position. The JWG should consider the following questions:

- a. Will animated display boards, models, or mock-up be used in the classroom? If so, will large numbers of these aids be required?
- b. Will all or certain courses be presented by programmed instruction text? If so, will this involve unusually high development costs as compared with similar courses?
- c. To what extent will audiovisual material be used? Will this involve especially heavy or extensive use of TV, motion pictures, slides, and sound-slides? If so, will individual study carrels be required?

These and similar questions are designed to identify training aids/media requirements that are unusual in that they require a long lead time to prepare the instructional material and/or are quite expensive to obtain.

A7.9.2 SUMMARIZE REQUIREMENTS FOR OICTP. Briefly summarize training aids/media requirements for operator and maintenance positions. Note that detailed requirements will be determined during preparation of the ICTP. Figure III-28 illustrates the format for this sub-paragraph.

7.j TRAINING AIDS AND INSTRUCTIONAL MEDIA

(1) USAFAS

- a. Five TV programs will be produced by USAFAS to support course XYZ
- b. Four RPV engine support stands will be fabricated by TASO, Ft. Sill, OK to support course ABC

(2) USAES

- a. 10 caramates will be required to support self-paced instruction for course BCD

(3) USATSCH - TBD

Figure III-28. Format for Summarizing Training Aids
Instructional Media Requirements for an OICTP
(From ICTP for RPV)

A7.10 Identify Training Literature Requirements

OVERVIEW

PURPOSE. During this activity the need for new or revised Field Manuals, How-to-Fight Manuals, Training Circulars, and similar training literature is identified. Later on, when an ICTP is prepared, more detailed information (number of pages involved, projected submission dates, etc.) can be provided.

TSM/AO RESPONSIBILITIES. This activity is best accomplished by the Joint Working Group convened for activity A7.9, which also should be utilized for activities A10 and A11. The AO establishes the JWG and gives it assignments. Also, the AO requests inputs from other schools and consolidates all inputs into the appropriate OICTP sub-paragraph.

SOURCES OF ASSISTANCE. Members of the JWG and AOs at other schools.

PROCEDURES

A7.10.1 IDENTIFY MOSs INVOLVED. Operator and maintenance MOSs required in support of the system were identified during activity A7.3. Obtain the output of that activity. This material, which was prepared for sub-paragraph 7.3 of the OICTP, provides a list of existing and new MOS requirements.

A7.10.2 IDENTIFY TRAINING LITERATURE FOR EXISTING MOSs. For those MOS requirements that will be met by existing MOSs, determine what training literature has been prepared for each MOS. Look for relevant Field Manuals, How-to-Fight Manuals, and Training Circulars. Obtain the title and number of all relevant literature, and obtain copies if available.

A7.10.3 PREPARE TRAINING LITERATURE REQUIREMENT ESTIMATES. Prepare a tabular outline, a Training Literature Requirements Matrix, as shown in Figure

III-29. List all MOSs across the top of the table, and all existing training literature down the left side. Consider each existing MOS in terms of the need to:

- a. Revise an existing manual/circular
- b. Leave it as it is
- c. Completely rewrite it

Indicate the collective judgment of the JWG by recording R(revise), NC(no change), or N(new) in the appropriate matrix cells.

For new MOS requirements, indicate the need for a completely new document (N) when this is the judgment of the JWG.

A7.10.4 OBTAIN INPUTS FROM OTHER SCHOOLS. Forward the Literature Requirements Matrix to other appropriate schools. Request them to:

- a. Review the judgments contained in the matrix.
- b. Provide similar judgments for any MOSs under their jurisdiction.

A7.10.5 CONSOLIDATE INPUTS FROM ALL SCHOOLS. Update the table prepared during A7.10.3 by incorporating into it new inputs and comments obtained from other schools. Insert this table into the OICTP as sub-paragraph 7.k. If the table is a lengthy one, attach it as an appendix to the OICTP and summarize its contents for sub-paragraph 7.k.

A7.11 Identify Requirements for Doctrinal, Maintenance, etc. Publications

OVERVIEW

PURPOSE. A variety of documents have to be produced or revised when a new system is introduced to the field. This activity, an extension of A7.10, examines the need to revise existing documents or to prepare new ones.

TSM/AO RESPONSIBILITIES. Same as for A7.10. The two activities should be accomplished concurrently by the same personnel.

SOURCES OF ASSISTANCE. Same as for A7.10.

PROCEDURES

A7.11.1 IDENTIFY PUBLICATIONS TO CONSIDER. This activity is comparable to activity A7.10.2. It involves determining the publications relevant to each MOS identified in A7.10.1. These publications may include Soldier's Manuals (SM), Commander's Manuals (CM), Skill Qualification Tests (SQT), Army Test and Evaluation Program (ARTEP), Skill Performance Aids (SPA - Maintenance Manuals and Extension Training Material), and Technical Extension Course (TEC) material.

A7.11.2 DEVELOP EXPANDED TRAINING LITERATURE REQUIREMENTS MATRIX. Add the list of publications identified during A7.11.1 to the Training Literature Requirements Matrix developed during activity A7.10.

A7.11.3 PREPARE PUBLICATION REQUIREMENT ESTIMATES. Proceed as described for activity A7.10.3.

A7.11.4 OBTAIN INPUTS FROM OTHER SCHOOLS. Proceed as described for activity A7.10.4.

A7.11.5 CONSOLIDATE INPUTS FROM ALL SCHOOLS. Proceed as described for activity A7.10.5. Prepare a summary statement of the requirements and incorporate into the OICTP as sub-paragraph 7.n. As an alternative, prepare a requirements matrix for only the publications considered during this activity and use this matrix table as sub-paragraph 7.n.

7.g TRAINING EQUIPMENT REQUIREMENTS

(1) Operator Training

(a) Course #1	Location #1	FY82	FY83	FY84	FY85	FY86
---------------	-------------	------	------	------	------	------

- (1) Full system
- (2) Subsystem #1
- (3) Subsystem #2

(b) Course #1	Location #2
---------------	-------------

- (1) Full System
- (2) Subsystem #1
- (c) Subsystem #s

(c) Course #2

(2) Maintenance Training

(a) Course #1

(b) Course #2

Figure III-26. Format for Matrix of Estimated Requirement
for Training Equipment

- A. Instructor with Standard Aids
 - 1. Instructor
 - 2. Charts and Display Boards
 - 3. Overhead Transparencies
- B. Printed Materials
 - 1. Standard Printed Materials
 - 2. Programmed Instruction Texts
 - 3. Microform
- C. Audio Visual
 - 1. Audio Tapes
 - 2. Slides and Sound-Slides
 - 3. Filmstrips and Sound-Filmstrips
 - 4. Motion Pictures and Sound Motion Pictures
 - 5. Television and Video Recordings
- D. Training Devices and Simulators
 - 1. Teaching Machines
 - 2. Models and Mock-ups
 - 3. Hardware Simulator-Trainers
 - 4. Actual Objects
- E. Computer Mediated Instruction
 - 1. Computer Managed Instruction
 - 2. Computer Aided Instruction

Figure III-27. Representative Instructional Media

Support Training Literature	Existing MOSs			New MOS Requirements		
	MOS-A	MOS-B	MOS-C	MOS-ABC	MOS-DEF	MOS-XYZ
Existing Literature: Field Manual #1 Field Manual #2 Tng Circular #1	NC	-	-			
	-	R	R			
	NC	-	N			
New Literature Requirements: Field Manual #1 Field Manual #2 Tng Circular #1				N	-	-
				-	N	-
				N	N	N

Figure III-29. Illustration of a Training Literature Requirements Matrix

A7.12 Identify Ammunition and Range Requirements

OVERVIEW

PURPOSE. Some courses have extensive ammunition and range use requirements. The increasing cost of ammunition and land for new ranges makes it imperative that an early estimate of these needs be made. For an OICTP these estimates are very gross. Nonetheless, they provide an early warning of two important requirements that eventually must be met.

TSM/AO RESPONSIBILITIES. The estimates can be developed by the JWG convened to accomplish activities A7.9 and A7.10. The AO is responsible for tasking this group, for obtaining inputs from other schools and for consolidating the inputs into a sub-paragraph for the OICTP.

SOURCES OF ASSISTANCE. TRADOC Training Circular 25-2, Army Range Requirements, may be useful.

PROCEDURES

A7.12.1 PREPARE WORKSHEET FOR MAKING ESTIMATES. A suitable format for a worksheet is shown in Figure III-30. The list of courses can be prescreened to delete those that obviously will not have an ammunition or range requirement.

A7.12.2 IDENTIFY COLLECTIVE TRAINING REQUIREMENTS. Identify the types of field exercises that may be used during training. For example, will crew training be a requirement? Also determine whether the proponent school will have to provide range facilities for ARTEPs or other exercises. During this activity assume that the new system will require firing exercises of some sort, probably similar to those currently conducted for comparable systems.

A7.12.3 IDENTIFY AMMUNITION AND RANGE REQUIREMENTS. Using Form A7.12.1 as a work sheet, review each course for ammunition and range requirements.

- a. Indicate by a check those courses that have a requirement.

	Ammunition Requirement			Range Requirements		
	<u>None</u>	<u>Light</u>	<u>Heavy</u>	<u>Access to Existing Range</u>	<u>New Range</u>	<u>Other</u>
Courses						
Exercises						

Figure III-30. Form A7.12.1, Worksheet for Estimating Ammunition and Range Requirements

- b. For each ammunition requirement judge whether the requirement is light or heavy. If possible, note the type of ammunition involved, to include dummy round.
- c. For each range requirement judge whether the requirement involves gaining access to an existing range or acquiring a new range.
- d. Using the foregoing procedures, estimate the ammunition and range requirement for crew training, ARTEPS, and other probable types of exercises.

A7.12.4 OBTAIN INPUTS FROM OTHER SCHOOLS. Forward table of judgments developed during A7.12.3 to other relevant schools. Request inputs for courses and exercises under their jurisdiction. Request comments on judgments made during activity A7.12.3.

A7.12.5 CONSOLIDATE AMMUNITION REQUIREMENTS. Develop in tabular form the estimated ammunition requirements. If the table is extensive, attach it as an appendix to the OICTP. Prepare a summary paragraph and incorporate it as subparagraph 7.i of the OICTP.

A7.12.6 CONSOLIDATE RANGE REQUIREMENTS. Develop range requirements in tabular form. If the table is a short one, add it to subparagraph 7.f, Facility Requirements. Otherwise, attach it as an appendix and incorporate a summary statement into subparagraph 7.f of the OICTP.

A7.13 Identify "Other" Support Requirements

"Other" support requirements include the need for POL, administrative/ billeting facilities, office supplies, repair parts, and various types of expendables. These types of support ordinarily need not be presented in an OICTP. However, if a heavy requirement has been identified during other A7 activities, that need should be expressed in the OICTP. Such a statement might be: "an unusually heavy requirement for spare parts is anticipated for maintenance course XYZ."

A7.14 Identify OPFOR Training Requirements

These requirements need not be stated in an OICTP. They are identified for the ICTP prepared following DT/OT I.

A7.15. Identify NET Requirements

OVERVIEW

PURPOSE. New Equipment Training (NET) requirements are identified by the materiel developer in cooperation with the training developer. NET requirements are first described in detail in the ICTP prepared following DT/OT I, and need not be presented in detail in the OICTP. However, paragraph 4, Training Strategy, of the OICTP should contain a description of the extent to which normal NET requirements apply to the system under development.

TSM/AO RESPONSIBILITIES. The AO requests the materiel developer to review the four phases of the NET process and to estimate the extent to which the requirements for each of these phases applies. The materiel developer prepares a statement of NET requirements and the AO incorporates this into the ICTP.

SOURCES OF ASSISTANCE. Key references for this activity are AR 71-5, Introduction of New or Modified Systems/Equipment, and AR 350-35, New Equipment Training and Introduction.

PROCEDURES

A7.15.1 JUDGE APPLICABILITY OF NET APPROACH. Normally a New Equipment Training Plan (NETP) is prepared by the materiel developer some months after submission of an OICTP (see NET milestone schedule, TRADOC Circular 351-8). During this activity, A7.15.1, the materiel developer estimates the degree to which standard NET requirements apply. NET requirements are described in AR 71-5 and are summarized in Table III-7. Some of the questions that should be considered during this activity are:

- a. When will the technical training course for key instructors and other personnel begin, before OT I or OT II? Usually, contractor training is used to prepare OT I players.
- b. How will field commanders be briefed on the new system, by NMITS (New Material Introduction Teams) or by NETT (New Equipment Training Teams)? Usually NMITS are used but it may be more cost-effective to employ NETTs.
- c. Where will NET be conducted? The standard procedure is to provide NET to field units as they receive their new equipment. An alternative is to provide NET at the proponent school's overseas training base (if it has one) or at the proponent school's CONUS facilities. A mix of all approaches may be employed.

A7.15.2 PREPARE SUMMARY STATEMENT OF NET REQUIREMENTS. This statement usually can be a paraphrase of the standard statement(s) of NET requirements modified by the answers to questions considered during activity A7.15.1. This statement describes the strategy for providing NET and therefore is included as a sub-paragraph of paragraph 4, Training Strategy, of the OICTP. This sub-paragraph can be cited by reference in sub-paragraph 7.b of the OICTP. An illustration of a summary NET requirements statement is contained in Figure III-31.

Table III-7

SUMMARY OF NET REQUIREMENTS BY PHASE

Phase 0 (Usually not considered a phase)	Prepare NETP (New Equipment Training Plan). This is a plan for training experienced unit personnel to operate/maintain new systems as they are introduced into the unit. The NETP also outlines the training of key personnel who then must develop programs for the sustainment training of new system personnel.
Phase I	Conduct Staff Planner Course. This is a course conducted by the prime contractor, with DARCOM assistance. The course is for persons who must plan for the development of institutional training programs.
Phase II	Conduct KIPT (Key Instructor and Personnel Training). This course is conducted by the system contractor. It prepares key instructors so they can develop the required institutional courses and other required training-related material. It also is used to train DT/OT personnel and depot personnel as required.
Phase III	<ul style="list-style-type: none">a. Prepare NMIL (New Materiel Introduction Letter). This letter informs field commanders that they are to receive the new system, and it contains information about the system.b. Develop NMITs (New Materiel Introduction Teams). These teams brief major commands on new systems/equipment prior to or at the time of system/ equipment delivery.
Phase IV	Develop NETT (New Equipment Training Teams). These teams teach experienced unit personnel how to operate and maintain the new system or equipment.

4. Training Strategy: The training program for the RPV will be implemented and accomplished in three phases: (1) New Equipment Training (NET); (2) Institutional Training; (3) Unit Training.

a. NET TRAINING: NET will provide the initial transfer of system technical information from the materiel developer to key military and Government personnel. These personnel will establish the resident training base and serve in positions which require a knowledge of the RPV System. NET includes courses conducted for staff planning personnel, technical training courses, the new materiel introduction program (New Materiel Introduction Letters and New Materiel Introduction Teams) and the new equipment training program. Transition training will be provided by NETT (New Equipment Training Teams). NET efforts will be coordinated and provided through the joint effort of CERCOM and TSARCOM.

Figure III-31. Illustration of a NET Requirements Statement (Adapted from ICTP for RPV)

A7.16 Identify Funding Requirements

OVERVIEW

PURPOSE. When an OICTP is prepared, detailed information upon which to base estimates of new funding requirements seldom is available. For this reason funding statements in terms of dollar estimates need not be prepared for an OICTP. However, it is possible to make gross, relative estimates of funding requirements early in the development of a new system. Such estimates should be developed and incorporated into the OICTP.

TSM/AO RESPONSIBILITIES. The TSM/AO is responsible for obtaining and collating funding estimates. The estimates themselves are prepared by the persons who developed the requirement estimates for each of the other subparagraphs of paragraph 7, Details, of the OICTP.

SOURCES OF ASSISTANCE. The comptroller's office at the proponent school and at other schools is responsible for making certain of the estimates contained in the OICTP. Cost control offices within the DTD also may be of assistance.

PROCEDURES

A7.16.1 OBTAIN ESTIMATED PER UNIT COST OF SYSTEM. The materiel developer can provide the TSM/AO with a rough estimate of the per unit cost of the new system. Estimates of \$10 million or less can be rounded to the nearest one hundred thousand dollars. Estimates of over \$10 million can be rounded off to the nearest million. In the event that the estimated per unit cost of the system has not yet been developed, ask the PM to make an "educated estimate".

A7.16.2 DEFINE BOUNDARIES OF JUDGMENT CATEGORIES. During this activity judgments are to be defined in terms of verbal categories, stated with respect to system unit costs. That is, the definition for a verbal category represents a percentage range of the estimated unit cost for the system. As an example, the four judgment categories used can be defined as follows:

Minor	Equals 5% or less of estimated system unit cost
Noticeable	Equals 5+ through 20% of estimated system unit cost
Considerable	Equals 20+ through 50% of estimated system unit cost
Major	Equals 50 percent plus of estimated system unit cost

The TSM/AO establishes tentative definitions for these categories and staffs them with the training materiel developers. A final set of definitions is prepared, based on reviewer suggestions and comments.

A7.16.3 PREPARE NEW FUNDING REQUIREMENTS ESTIMATE MATRIX. This matrix, prepared by the TSM/AO lists all major types/categories of requirements identified during the preparation of paragraph 6 of the OICTP. The vertical rows of the matrix are defined by the four judgment categories developed during activity A7.17.2. An illustration of such a matrix is shown in Figure III-32.

Unit Cost _____				
<u>Requirement</u>	Estimated Cost Relative to Unit Costs			
	<u>Minor</u>	<u>Noticeable</u>	<u>Considerable</u>	<u>Major</u>
NET				
Institutional Courses				
Correspondence Courses				
Instructor & Support Personnel				
Facilities/Range				
Training Equip.				
Ammunition				
Training Aids and Media				
Training Literature				
Training Devices				
Other				
Publications				
OPFOR				

Figure III-32. Illustration of a Funding Requirements Estimate Matrix for an OICTP

A7.16.4 OBTAIN FUNDING ESTIMATES. The TSM/AO forwards the New Funding Requirements Estimate Matrix to each person/group/element responsible for the estimates in the OICTP. Request that they prepare a gross estimate of funding requirements for each requirement for which they are responsible (NET, institution courses, instructor, etc.). Provide each respondent with a definition of the judgment categories and a brief description of the data and rationale upon which the definitions are based.

A7.16.5 ADJUST FUNDING ESTIMATES. The estimates developed during A7.16.4 may give a false impression, since they reflect the total cost of a training requirement as compared with the cost of a single system unit. Correct this impression as follows:

- a. From the PM obtain an estimate of the total number of systems to be purchased over a 5-year period beginning with Phase IV of the LCSMII.
- b. Prepare an introductory statement for the funding sub-paragraph. This paragraph can be stated somewhat as follows:

"The following estimates are based on a comparison of total training requirements to the estimated cost of one unit of the system. It is estimated that over a 5-year period the cost of the training support system will be prorated over at least _____ system (equipment) units."

A7.16.6 PREPARE SUB-PARAGRAPH FOR OICTP. An illustration of how the funding estimates can be presented in an OICTP is shown in Figure III-33. Note that funding costs of a "minor" nature need not be included in the final set of estimates.

A7.17 Prepare Task and Objectives Schedules

OVERVIEW

PURPOSE. The purpose of this activity is to prepare a list of objectives that must be met in order to accomplish development of the training support system. This schedule is keyed to major events in the system development

7.h FUNDING REQUIREMENTS. The following estimates are based on a comparison of total training requirements to the estimated cost of one unit of the system. It is estimated that over a 5-year period the cost of the training support system will be prorated over at least 100 systems.

Requirement	Estimated Total Cost Over a 5-year Period		
	<u>Noticeable^a</u>	<u>Considerable^b</u>	<u>Major^c</u>
NET			
Institutional Courses			
Correspondence Courses			
Instructor/Support Personnel			
Training Literature			
Training Devices			
Other			
^a Noticeable: 6 - 20% of system unit cost of \$5 million			
^b Considerable: 21 - 50% of system unit cost			
^c Major: 50%+ of system unit cost			

Figure III-33. Illustration of a Funding Requirements Sub-Paragraph for an OICTP

schedule prepared by the PII. Each objective is analyzed into its major tasks, then a consolidated schedule of tasks is developed by fiscal year and quarter. The schedule objectives should be based on the major training events discussed in this handbook. The schedules prepared for an OICTP need not go beyond the scheduled date for OT I.

TSM/AO RESPONSIBILITIES. The TSM/AO prepares the Task and Objectives Schedule. He is assisted by all the persons and organizational elements involved in preparing portions of paragraph 7 of the OICTP.

SOURCES OF ASSISTANCE. The task schedule should be based on the Product Oriented Planning Schedules contained in Appendix D, TRADOC Circular 351-8.

PROCEDURES

A7.17.1 DEVELOP OBJECTIVES SCHEDULE. These objectives are similar to the major training events listed in this handbook, in DA Pamphlet 11-25, and in TRADOC Reg 600-4. For most developing systems these objectives are:

- a. Select cost-effective training approach.
- b. Prepare training paragraphs and annexes for Outline Development Plan.
- c. Develop training test issues for OT I.
- d. Develop training support package for OT I.
- e. Develop/submit requirements for long lead time items such as training devices and new facilities.

The TSM/AO, in cooperation with appropriate representatives of the training and material developer, should identify the need for accomplishing the above objectives and for any other objectives. This analysis is based on the requirements described in TRADOC Reg 600-4 and on the requirements identified in the sub-paragraphs of paragraph 7 of the OICTP.

A7.17.2 DEVELOP TASK SCHEDULE. The objectives identified during A7.17.1 are achieved by performing one or more product-oriented tasks. Many of these tasks are identified in Appendix D of TRADOC Circular 351-8. For each objective listed in A7.17.1:

- a. Study the product-oriented schedules in TRADOC Circular 351-8 and determine the tasks that must be accomplished for each objective.
- b. Using the schedules contained in TRADOC Circular 351-8, and the scheduled date for OT I, develop a task schedule for each objective. State the fiscal year and quarter during which each task should be accomplished. As an example, a study of the material in TRADOC Circular 351-8 indicates that the major tasks associated with development of a training support package for OT I are:
 - (1) Analysis of contractor-provided FEA/LSA data to identify high risk requirements.
 - (2) Development of draft SPA material for high risk tasks.
 - (3) Development of TEC material for high risk tasks.
 - (4) Development of a breadboard version of any training device(s) required to teach OT I players.

The appropriateness of each of the above tasks for OT I must be considered in light of the goals of OT I. For example, if a decision has been made not to validate training device concepts during OT I, then there is no need to develop training devices for OT I.

Ask appropriate elements of the training and materiel developer to prepare schedules for those objectives for which they are responsible.

A7.17.3 PREPARE CONSOLIDATED SCHEDULE FOR TRAINING OBJECTIVES AND TASKS.

Sub-paragraph (1) of OICTP paragraph 7b contains the schedule for training objectives. Subparagraph (2) contains a consolidated schedule of tasks that must be accomplished prior to OT I. A partial illustration of such schedules, taken from RPV ICTP, is shown in Figure III-34.

a. TASK AND OBJECTIVE SCHEDULE:

TASK/OBJECTIVE	RESPONSIBLE AGENCY	START	COMPLETE
Develop RPV Classroom Training Device Requirement.	DTD, USAFAS with Input from CFD and DCRDT.	July 80	Sept 80
Submit training test support package to OTEA.	USAFAS (DTD with input from CFD, DCRDT) and other affected TRADPC schools	Jun 81	Jan 82
Submit draft field manual	CFD, USAFAS	Aug 81	Jan 82
Provide personnel for RPV DT II Players/Instructor course to establish institutional expertise for RPV system.	Conducted by LMSC: affected TRADOC schools provide student instructor personnel	Jan 82	Apr 82
Conduct training of OT II Player Personnel	CFD, USAFAS and affected TRADOC schools	Jun 82	Sep 82
Begin OT II	OTEA	Oct 82	Dec 82
Begin production phase IKPT course	Conducted by LMSC	July 83	Dec 83
Begin formal institutional training RPV platoon personnel	CFD, USAFAS	Mar 84	

b. TASK SCHEDULE:

TASK	TIME FRAME Q/FM
(1) Monitor Development	Continuous
(2) Develop Outline of OICTP	2QFY80
(3) Review MICNS TM Outlines	2QFY80
(4) SPA (TM/ETM) IPR	2QFY80
(5) SPA IPR	3QFY80

Figure III-34. Partial Illustration of a Task and Objective Schedule
(From ICTP for RPV)

A7.18 Prepare General Paragraph of OICTP/ICTP

OVERVIEW

PURPOSE. This paragraph is a fairly standard one that appears in all OICTP/ICTPs. It consists of four sub-paragraphs which collectively address the following topics: (a) purpose of the OICTP/ICTP, (b) scope of the OICTP/ICTP, (c) development of statement of approach to training, and (d) revision or the expected frequency of reviews and updates of the OICTP/ICTP.

TSM/AO RESPONSIBILITY. The TSM/AO prepares this paragraph.

SOURCES OF ASSISTANCE. TRADOC Circular 351-8 and illustrations from other OICTP/ICTPs.

PROCEDURES

A7.18.1 PREPARE STATEMENT OF PURPOSE. This sub-paragraph provides a brief statement of the purpose of the OICTP/ICTP. Two illustrations of a Purpose statement are shown in Figure III-35.

A7.18.2 PREPARE STATEMENT OF SCOPE. This sub-paragraph summarizes in a very terse manner all the major topics covered in the details section (paragraph 7) of the OICTP/ICTP. The contents of the Scope sub-paragraph include:

- a. The name of the system and the type(s) of training addressed.
- b. A listing of the specific types of training programs covered by the OICTP/ICTP. Information for this statement comes from sub-paragraphs 7.b through 7.o of the OICTP/ICTP.
- c. A list of the major requirements covered in sub-paragraphs 7.e through 7.o of the OICTP/ICTP.
- d. As appropriate, a statement of the need for new funding.
- e. A statement to the effect that the OICTP/ICTP is a management document and that the requirements listed in the document require separate action through appropriate channels.

ILLUSTRATION A (Petroleum Hoseline System)

2. General:

a. PURPOSE: This ICTP is a concept and planning document designed to provide milestones, requirements, strategies and information for the integration of the Petroleum Hoseline System into the US Army training program. It sets forth the guidelines, responsibilities and established objectives for use by all US Army organizations and activities engaged in planning and developing the training programs which will support the fielded system. This ICTP is based on information available at the time of its development and upon the assumptions listed in Paragraph 5.

ILLUSTRATION B (RPV System)

2. General:

a. PURPOSE: This document provides the Individual and Collective Training (ICTP) for the Remotely Piloted Vehicle (RPV) System.

Figure III-35. Illustrations of the Purpose Sub-Paragraph
for an OICTP/ICTP

f. A statement that the document is subject to change and update.

Illustration of a Scope sub-paragraph are shown in Figure III-36.

A7.18.3 PREPARE DEVELOPMENT SUB-PARAGRAPH. The Development sub-paragraph "should briefly state the approach to training that will be used in developing the training program to support the system/equipment and the areas which have been subject to special emphasis." Illustrations of a Development sub-paragraph are shown in Figure III-37.

A7.18.4 PREPARE REVISION SUB-PARAGRAPH. The Revision sub-paragraph briefly states the frequency with which the OICTP/ICTP will be reviewed and updated. Normally the document is reviewed/updated on an annual basis. Also it is reviewed and updated before or during the preparation of each requirement document (e.g., Letter of Agreement, Outline Acquisition Plan, Required Operational Capability). Also it is reviewed and updated following each Operational Test. Illustrations of a revision sub-paragraph are shown in Figure III-38.

A7.19 Prepare Equipment Description Paragraph

OVERVIEW

PURPOSE. This paragraph contains a brief description of the system/equipment.

TSM/AO RESPONSIBILITIES. The TSM/AO requests the PM to prepare this paragraph.

SOURCES OF ASSISTANCE. The materiel developer.

PROCEDURES

A7.19.1 OBTAIN SYSTEM DESCRIPTION FROM PM. Request latest description of proposed system/equipment from the PM. If you already have a system description, check with the PM to assure that the description is current.

ILLUSTRATION A (Petroleum Hoseline System)

b. SCOPE: This OICTP addresses the institution and extension training program of the Petroleum Hoseline System. The plan outlines the requirements for New Equipment Training, Training of Test Player Personnel, Institutional Training, Nonresident Training, and Unit Training. In addition, the plan identifies overall USAQMS requirements for instructor and support personnel, training equipment, training aids, and the need for SQT, SM, and ARTEP. A summary of new funding requirements also is provided. This OICTP is a management and planning document; therefore, the requirements specified herein require separate actions through appropriate channels as necessary. Any changes in the development program for this system will cause corresponding changes in the preparation for the conduct of training. Moreover, the development of more detailed data for the system may lead to changes in the training strategy and training concept.

ILLUSTRATION B (RPV System)

b. SCOPE: The information in the ICTP is based on the RPV development and delivery milestones in the developers milestone schedule.

Figure III-36. Illustrations of a Scope Sub-Paragraph
for an OICTP/ICTP

ILLUSTRATION A (Petroleum Hoseline System)

c. DEVELOPMENT: The Instructional System Development (ISD) approach to training will be followed in the development of all training and training materials associated with this system. This will provide an orderly process for analyzing the training and evaluating and improving the effectiveness of the training program(s). To the extent possible, contractor SPA training materials will be used in conjunction with materials developed by government subject matter experts to support resident and nonresident training programs.

ILLUSTRATION B (RPV System)

c. DEVELOPMENT: This ICTP provides information for equipment, facilities, personnel, funds and literature. The TRADOC system proponent is the US Army Artillery School (USAFAS).

Figure III-37. Illustrations of a Development
Sub-Paragraph for an OICTP/ICTP

ILLUSTRATION A (Petroleum Hoseline System)

d. REVISIONS: This OICTP is considered a dynamic document and as such will be reviewed and updated, as a minimum on an annual basis. As appropriate it will be reviewed and updated during the preparation of all Requirements Documents and following all Operational Tests (OT).

ILLUSTRATION B (RPV System)

d. REVISIONS: This plan will be updated annually or as more information becomes available or as major changes occur in the development.

Figure III-38. Illustrations of a Revision
Sub-Paragraph for an OICTP/ICTP

A7.19.2 PREPARE DESCRIPTION PARAGRAPH. The summary description of the system/equipment should contain a short account of the physical characteristics of the system and a brief description of its functional characteristics -- what the system will do, including general performance parameters. If you wish, a detailed description of the system's proposed physical characteristics, with a list of performance capabilities, can be included as an appendix to the OICTP/ICTP. An illustration of a description paragraph is shown in Figure III-39.

A7.20 Prepare Training Strategy Paragraph

OVERVIEW

PURPOSE. This paragraph summarizes the planned strategy by which the training is to be implemented. This summary covers both the institutional and the unit environment. It describes the means by which unit proficiency can be gained and maintained through training in order to support development and user testing. Also, it describes how unit proficiency will be gained and maintained after the new system/equipment is deployed.

TSM/AO RESPONSIBILITIES. The TSM/AO is responsible for preparing this paragraph.

SOURCES OF ASSISTANCE. All persons involved in the preparation of paragraph 7 of the OICTP/ICTP can be requested to review and/or provide inputs for this paragraph.

PROCEDURES

A7.20.1 OUTLINE TRAINING IMPLEMENTATION STRATEGY. Training for a new system usually is implemented in three stages -- New Equipment Training (NET), Institutional training, and Unit training.

ILLUSTRATION A (Petroleum Hoseline System)

3. Description of Equipment. The Petroleum Hoseline System is a high capacity fuel transportation hose system which can be deployed and recovered rapidly to move large quantities of fuel within the corps and division rear areas of operation when alternative methods are not tactically desirable or effective. It will replace the existing 4 inch hoseline outfit and will have at least double the throughput capacity of the 4 inch system. The system will be capable of operating on a 20 hour basis, be air transportable, and will be able to perform (deployment, operation, and recover), be stored and be transported in climatic conditions 1 through 6 (AR 70-38). The system will be capable of delivering 600-800 GPM and will be interoperable and compatible for use with existing fuel distribution systems. The system will consist of: a pump-engine assembly; 1 1/2 to 3 miles of hoseline; equipment for hoseline deployment, handling, recovery and storage; and required ancillary items. Additional performance and physical characteristics are described in Appendix A.

Figure III-39. Illustrations of a Description of
Equipment Paragraph for an OICTP/ICTP

ILLUSTRATION B (RPV System)

3. Description of Equipment.

a. SYSTEM DESCRIPTION: the U. S. Army Remotely Piloted Vehicle (RPV) System performs target acquisition, laser target designation, aerial reconnaissance and artillery adjustment missions. A small unmanned air vehicle, including its mission payload, is controlled from a ground control station (GCS) and video imagery and target location information are returned via an anti-jam data link.

(1) The system consist of an air vehicle, ground control station (GSS), remote ground terminal (RGT), launch equipment, recovery equipment and support equipment. The small fixed-wing aircraft carries a target acquisition and designation system as a mission payload. The current mission payload consits of a TV sensor and laser rangefinder/designator with stabilized optics. The air vehicle and mission payload are controlled from the GCS through the Modular Integrated Communications and Navigation System (MICNS). The MICNS consist of airborne and ground data terminals (GDT) that provide an anti-jam command and data link. The GDT consists of a control unit in the GCS and Remote Ground Terminal (RGT) which tracks, commands and receives data from the air vehicle.

(2) The GCS is the operation center and is housed in a mobile shelter. It includes a mission planning facility, control and display consoles, computer and processing equipment and tactical communications equipment. A truck mounted hydraulic launch subsystem catapults the air vehicle into the air. When the mission is completed, the air vehicle is automatically guided to a truck-mounted vertical net recovery subsystem. The support equipment includes ground power generators, a maintenance shelter, ground test equipment, trucks, trailers and other equipment.

Figure III-39. Illustrations of a Description of
Equipment Paragraph for an OICTP/ICTP
(Continued)

NET provides key instructor personnel with the system knowledge they need to develop course material. This is supplemented and supported by SPA material prepared by the system contractor. Transition training (training the first units to receive the new system) is accomplished by NETT (New Equipment Training Teams).

OT II players are trained using a draft version of the courses to be used for institution training. Following refinement, these courses are presented on a continuing basis by the various schools responsible for portions of training for the new system. Institutional training is based on task analysis data provided by the contractor, SPA materials, special training devices/simulators when appropriate, and training aids and media originally used by the contractor to teach key instructor personnel.

Along with the development of institutional training material, means of evaluating individual and unit proficiency must be developed. Materials for assessing individuals are prepared as part of the SQT program. This material includes Commander's Manuals, Soldier's Manuals, and Skill Qualification Tests. ARTEPs (Army Training and Evaluation Programs) are revised or new ones are developed to evaluate unit proficiency.

NET, institution training, and unit training are the three phases of the usual implementation scheme for a new system's training subsystem. Review the OICTP/ICTP material prepared for the sub-paragraphs of paragraph 7 of the OICTP. Determine whether the requirements described in those sub-paragraphs can be accomplished using the traditional implementation strategy. If not, note any differences and describe these differences in one of the following subparagraphs.

A7.20.2 PREPARE NET SUB-PARAGRAPH. This is a summary of material prepared for sub-paragraph 7.b of the OICTP/ICTP. This summary should provide answers to the following questions:

- a. How will knowledge of the system be transferred to course/training material developers? (Usually this is accomplished during the NET process.)
- b. Who will establish the resident training base? (Usually this is done by key instructor personnel from the proponent school(s)).
- c. How will training of initial units to receive the system be accomplished? (Usually this is accomplished by New Equipment Training Teams.)

Paragraph 4.a, Figure III-40 is an illustration of a Strategy sub-paragraph for NET training.

A7.20.3 PREPARE INSTITUTIONAL TRAINING SUB-PARAGRAPH. This is a summary of material prepared for sub-paragraph 7.c of the OICTP/ICTP. At a minimum this summary should answer the following questions.

- a. What school(s) will provide institutional training, and what type of training will they provide? (List each school and briefly describe the course(s) each will present.)
- b. Where will the data base come from for institutional and other forms of training material? (Typically, the data base comes from contractor training programs, SPA material, NET training programs, and existing courses/material as appropriate.)
- c. Will special training devices/simulators be developed for institution training? (Summarize sub-paragraph 7.k of the OICTP/ICTP).
- d. How will individual end units be evaluated? (This usually is done through the use of Performance Evaluations for individuals and collective tasks.

Paragraph 4.b, Figure III-40 illustrates a Strategy sub-paragraph for institution training.

4. Training Strategy: The training program for the RPV will be implemented and accomplished in three phases: 1) New Equipment Training (NET); 2) Institutional Training; 3) Unit Training.

a. NET TRAINING. NET will provide the initial transfer of system technical information from the materiel developer to key military and Government personnel. These personnel will establish the resident training base and serve in positions which require a knowledge of the RPV System. NET includes courses conducted for staff planning personnel, technical training courses, the new materiel introduction program (New Materiel Introduction Letters and New Materiel Introduction Teams) and the new equipment training team program. NET efforts will be coordinated and provided through the joint effort of CERCOM and TSARCOM.

b. INSTITUTIONAL TRAINING:

(1) Training programs at the below listed TRADOC activities will provide institutional training for the RPV system.

(a) Ft. Sill, OK. The Counterfire Department (CFD) will provide operator and organizational maintenance/aviation unit maintenance (AVUM) training.

(b) Ft. Eustis, VA. The US Army Transportation School will provide Aviation Intermediate Maintenance (AVIM) training for proponent MOSs.

(c) Ft. Gordon, GA. The US Army Signal School will provide direct support (DS) and general support (GS) maintenance training for affected proponent MOSs.

(d) Ft. Belvoir, VA. The US Army Engineer School will provide utilities equipment repair, power generator equipment repair and special electronic devices repair training.

(e) Aberdeen Proving Grounds, MD. The US Army Ordnance and Chemical School will provide DS/GS maintenance training on RPV lasers, and the ground control station, the RPV launcher, and retrieval sub-systems.

(2) These training programs will be based on analysis of skill performance aids (SPAs) products, knowledge gained from NET, DT/OT training and testing and Cost and Training Effectiveness Analysis (CTEA) input, applicable Army Training and Evaluation Program (ARTEP) and Soldiers' Manual. Training programs will use the contractor developed training and training aids. Appropriate existing officer and NCO courses will be modified to incorporate necessary instruction, doctrinal issues and concepts of employment. Applicable soldier's manual (SM) and Commander's Manuals (CM) will be written/revised as required to incorporate required RPV data for Skill Qualification Test (SQT). Applicable Army Training and Evaluation Programs (ARTEP) will be revised.

Figure III-40. Illustration of a Training Strategy Paragraph
for an OICTP/ICTP (From ICTP for RPV)

c. UNIT TRAINING:

(1) Unit training will supplement institutional training and qualify required military personnel to meet the operational requirements of the RPV System.

(2) Unit level training will be conducted by unit Commanders IAW guidance contained in the CM and appropriate ARTEP.

(3) Individual operator training will take place through the use of a programable operator proficiency simulator. Each ground control station (GCS) in a RPV platoon has provisions to accept the embedded trainer. Tentatively each platoon will be issued one simulator. This trainer also provides the capability to program simulated faults into the GCS allowing the organizational maintenance personnel to maintain proficiency in troubleshooting procedures.

(4) Individual and crew training will be supported by extension training materials (ETM) procured in conjunction with SPAS equipment publications, and by self-study extension programs, technical extension courses (TEC), Job Performance Aids (JPAs), training aids and devices, Commander's Manuals, Soldier's Manuals, and ARTEPs.

Figure III-40. Illustration of a Training Strategy Paragraph
for an OICTP/ICTP (From ICTP for RPV)
(Continued)

A7.20.4 PREPARE UNIT TRAINING SUB-PARAGRAPH. This is a summary of all unit training-related material contained in the various sub-paragraphs of paragraph 7 of the OICTP/ICTP. Sub-paragraphs "c", "d", and "f" often contain information on unit training. The unit training sub-paragraph should answer the following questions:

- a. What is the relation between institutional and unit training? Will unit training supplement institutional training or serve as an alternative? (Unit training may teach new tasks or emphasize proficiency. If so, it supplements institution training. In some instances MOS training can be conducted solely within units. In such instances unit training serves as an alternative to institution training.)
- b. Will unit training cover both individual and crew training, or just crew training? (Often unit training includes crew training material (ETM), SPAs material, TEC (Training Extension Courses), and JPAs (Job Performance Aids). The training of individuals within a unit is supported by SQT material. Crew training within units is supported by ARTEPs.)

An illustration of a strategy sub-paragraph for unit training is contained in Figure III-40, sub-paragraph 4.c.

A7.21. Prepare Training Concept Paragraph

OVERVIEW

PURPOSE. This paragraph consists of sub-paragraphs which collectively describe how the training support system will be structured, the various portions of the training support system that must be developed, and the organizational elements responsible for developing and implementing each portion of the training support system. The sub-paragraphs describe how the training strategy contained in paragraph 4 of the OICTP/ICTP will be implemented. Paragraph 7 of the OICTP/ICTP describes the requirement that must be met in order to implement the training concept. Therefore, the training concept paragraph makes extensive use of the material contained in the sub-paragraphs of paragraph 7.

TSH/AO RESPONSIBILITIES. The DTD is responsible for the actual preparation of the training concept paragraph. The TSH/AO is responsible for tasking DTD and for assuring that material prepared for the training concept paragraph is organized into an appropriate format.

SOURCES OF ASSISTANCE. In addition to the guidance provided in TRADOC Circular 351-8 and in this handbook, any available copies of OICTP/ICTPs prepared at the proponent school should be obtained and studied carefully.

PROCEDURES

A7.21.1 IDENTIFY TOPICS TO COVER IN TRAINING CONCEPT PARAGRAPH. The training concept paragraph must address a number of topics. At a minimum, prepare one or more sub-paragraph to cover each of the following questions.

- a. Will SPA material be employed in support of the system? If so, who will prepare this material and how will it be employed?
- b. Are new or revised ARTEPs, CMs, SMs, and other training publications required? If so, who will prepare them?
- c. How will the training program for the system/equipment be structured? That is, where will various levels of operator and maintenance training be taught?
- d. Who is responsible for ensuring that the elements of the training support system collectively cover the total system? How will this responsibility be accomplished?
- e. What will be taught during institutional training? What schools are involved?
- f. What training responsibilities will be assumed by unit trainers?
- g. In addition to institutional courses, who will develop the other courses of instruction needed in support of the system?

In addition to the foregoing question areas, other topics which may be considered include:

- a. Will the training be implemented by Phase? If so, describe each phase, indicate what training will be accomplished during each phase, and specify the responsibilities of the schools involved.
- b. Are there special logistics considerations that should be mentioned? For example, who will maintain the training base equipment and any special training devices for the new system? Will contractor maintenance be employed once the equipment is deployed?

A7.21.2 PREPARE INTRODUCTORY STATEMENT. The training concept paragraph usually begins with a general statement followed by a number of sub-paragraphs, each addressing a specific topic. Figure III-41 contains two illustrations of such an introductory statement.

Illustration A

6. Training Concept: Training acquisition event and activities, while generally defined by the ISD process, must be structured and executed within the context of the overall system acquisition process for Army materiel systems as governed by the Army's Life Cycle System Management Model (LCSMM)

- a. SKILL PERFORMANCE AIDS (SPAs)

Illustration B

6. Training Concept.

- a. Phase Objectives

A four-phased approach will be used by the Field Artillery School for transition to resident/nonresident TACFIRE instruction in support of full deployment of TACFIRE equipment. The training objectives are as follows:

- (1) Phase I (DT/OT III Phase).

Figure III-41. Illustration of Introductory Statement for
a Training Concept Paragraph for an OICTP/ICTP

A7.21.3 PREPARE SUB-PARAGRAPH FOR SPAs MATERIAL. Most new systems are supported by SPAs material. Briefly describe the role of SPAs material, who will prepare it, how it will be validated, and who is responsible for obtaining the material. Figure III-42 contains an illustration of a training concept sub-paragraph covering SPA material.

a. SKILL PERFORMANCE AIDS (SPAs). The RPV Program Manager will procure a complete SPA package for the RPV system. The SPA package will be developed by the Lockheed Missile and Space Co. (LMSC), and Harris Corporation, to include a Logistics Support Analysis, task list, technical manuals, and ETM.

(1) Technical manuals will be prepared in accordance with MIL-M-63036 and 63038A. ETM will be prepared in accordance with MIL-M-63040.

(2) All training package materials will be validated by the developer and verified by the user.

RESPONSIBILITY: RPV Program Manager in coordination with DARCOM, Readiness Commands and TRADOC MOS proponent schools.

Figure III-42. Illustration of a Training Concept
Sub-Paragraph Covering SPA Material

A7.21.4 PREPARE SUB-PARAGRAPH ON ORGANIZATION OF THE TRAINING PROGRAM.

Most OICTP/ICTPs omit this sub-paragraph. In its place the discussion of institution and unit training contains a description of where various levels of operator and maintenance training will be taught.

A7.21.5 PREPARE SUB-PARAGRAPH ON INSTITUTIONAL TRAINING. This sub-paragraph describes in both general and specific terms the types of personnel and duty positions that will receive institutional training. It describes the courses by MOS and duty position, whether the course(s) is new or an add-on, and the school(s) responsible for the training. Any contingencies to the plans for

institutional training also are summarized. The sub-paragraph on institutional training can be a lengthy one. Therefore, it is permissible to summarize this material for both of the OICTP/ICTP and present the details in an appendix. Figure III-43 shows the Institutional Training sub-paragraph contained in the ICTP for the RPV system.

d. INSTITUTIONAL TRAINING: Institutional training will be conducted for all DA operational and maintenance personnel as stated below. This training will be designated for support of production RPV systems and will be based on the results of DT/OT II evaluation of operation and maintenance training courses conducted during the FSED phase. Since the DT/OT II courses will be validated and approved by the appropriate TRADOC schools/centers, they should require minimal restructuring to support the institutional training requirements..

(1) During the production and deployment phase USAFAS will conduct both individual and collective training (packet training) in order to field fully-trained units which will be able to perform their assigned mission with a minimum amount of time after deployment. This training will consist of formal classroom instruction, lab/hardstand exercises, GCS simulator, crew drill and actual flight.

(2) During the sustainment phase USAFAS will conduct all individual skill level 1 training for operator and organizational maintenance for the RPV MOS. The following courses are envisioned:

TITLE	MOS	APPROX LENGTH
RPV Operator	13XX	12 weeks
RPV Organizational Maintenance Repairman	13XX ASI	3 weeks
RPV Technician	21XX	15 weeks

(3) DS/GS maintenance personnel will be trained by the proponent MOS-producing schools.

(a) USA Engineer School (USAES). The following engineer MOSs will be used in support of the RPV system:

1. MOS 52C - Utilities Equipment Repairers. The current training program for MOS 52C is sufficient to enable them to perform their duties on the standard air-conditioning equipment in the RPV unit.

2. MOS 52D - Power Generator Equipment Repairers. The current training program for MOS 52D is sufficient to enable them to perform their duties on the standard air-power generator equipment to support the RPV unit.

3. MOS 35E - Special Electronic Devices Repairer. The concept of training for MOS 35E will be the current MOS training program plus Extension Training Material (ETM) for the RPV-peculiar equipment that the 35E will support. The ability of the 35E MOS holder to perform the required duties, after completing the ETM lessons, should be evaluated during the operational test for the system.

Figure III-43. Illustration of an Institutional Training Sub-Paragraph for the Training Concept Paragraph of an OICTP/ICTP (From RPV ICTP)

(b) USA Transportation School (USATSCH). RPV AVIM training of MOS 68B, 68G, 68F, and 68J will be accomplished by the transportation school. Additional training will be required in the following MOSs:

MOS	ADDITIONAL TRAINING
68B	1 day
68G	none
68F	1 week
68J	2 weeks

(c) USA Signal School (USASIGS). The US Army Signal School at Ft. Gordon, GA, will conduct training in support of all avionics equipment on the RPV. As it is presently envisioned that maintenance training for signal MOSs (26L, 26T, 35M, and 286A) supporting the RPV can be accomplished using SPAS developed exportable training packages. However, if FEA and tasks selected from training identified a need for institutional training, this training will be provided by the USASIGS&FG.

(d) USA Ordnance Center and School (USAOC&S). MOS 34G will provide DS/GS maintenance training on RPV lasers and the ground control station. MOS 63W will provide DS/GS maintenance on the RPV launcher and retrieval sub-systems.

Figure III-43. Illustration of an Institutional Training Sub-Paragraph
for the Training Concept Paragraph of an OICTP/ICTP (From RPV ICTP)
(Continued)

A7.21.6 PREPARE SUB-PARAGRAPH ON UNIT TRAINING. This sub-paragraph describes the responsibilities of unit commanders. It also may list the persons who will receive all or portions of their training within the unit. Figure III-44 contains an illustration of this type of sub-paragraph.

e. UNIT TRAINING. Training of unit personnel will be accomplished at unit level, guided by revised ARTEP 6-307. This training will be supported as described in para 4C. Unit commanders have the responsibility to:

(1) Train all personnel in safety precautions to be observed during conduct of mission operations.

(2) Insure that the OJT program is established to increase knowledge obtained in institutional courses.

(3) Insure that unit personnel are trained and ready for SQT evaluation and available to meet scheduled test dates.

(4) Insure that the deficiencies which can be attributed to formal training are reported to the appropriate service schools so that corrective action can be initiated.

(5) RPV Platoon composition will be as follows:

POSITION TITLE	GRADE	QUANTITY	MOS
PLTN Leader	LT	1	13D
PLTN Sgt	E-7	1	13XX
Lt Vehicle Driver	E-3	1	13XX
RPV Technician	WO	4	21XX
Section Chief	E-6	4	13X30
Senior Mission Payload Operator	E-5	4	13X20
Senior AV Operator	E-5	4	13X20
RPV Ground System Mechanic	E-5	4	13X20ASI
RPV Launch and Recovery Team Chief	E-5	4	13X20
Mission Payload Operator	E-4	4	13X10
AV Operator	E-4	4	13X10
AV Mechanic	E-4	4	13X10ASI
RPV Crewman	E-3	12	13X10
Power General and Wheeled Vehicle Mechanic	E-4	4	63B10

Figure III-44. Illustration of a Unit Training Sub-Paragraph for Paragraph 6 of an OICTP/ICTP

A7.21.7 PREPARE TOTAL SYSTEM TRAINING SUB-PARAGRAPH. This sub-paragraph describes who has overall responsibility for assuring that the elements of the training support system collectively cover all required training for the system. The organizational element having this responsibility often is responsible also for preparing exportable training packages and for assuring that these packages integrate appropriately with other elements of the training support system. Figure III-45 contains an illustration of a Systems Training Sub-Paragraph.

RESPONSIBILITY: TRADOC MOS proponent schools.

c. SYSTEMS TRAINING: The Directorate of Course Development and Training (DCRDT), USAFAS is responsible for integrating resident training with non-resident training and exportable training packages to insure the total system is trained. This integration will consist of media selection for training for MOS qualification, familiarization, tactical employment and unit collective tasks. Individual training to support the RPV System consists of resident training for operator and organizational maintenance personnel in skill level 1 familiarization training for supervising personnel and non-resident training and exportable training packages. These exportable packages will be developed for sustainment MOS training for skill levels 2 and 3. Specifically DCRDT will:

- (1) Determine appropriate media and written materials to support exportable packages in accordance with MIL-M-63040.
- (2) Insure development of exportable training packages.
- (3) Continuously review all POIs with a view toward improvement in instructional media and methods.

Figure III-45. Illustration of a Systems Training
Sub-Paragraph for the Training Concept
Paragraph of an OICTP/ICTP

A7.21.8 PREPARE COURSE DEVELOPMENT SUB-PARAGRAPH. During the development of a new system a variety of training courses are needed. This sub-paragraph lists these courses and states who is responsible for their preparation. The types of courses include: (a) courses for training DT/OT players, (b) instructor and key personnel training course, (c) correspondence courses, and (d) exportable training material. Institutional courses need not be included in this list since they are discussed in another sub-paragraph. An example of a Course Development sub-paragraph is contained in Figure III-46.

f. Development of Courses of Instruction:

(1) Test Support Training. Test player training for OT II test phase will be conducted by CFD, USAFAS as outlined in para 7a.

(2) DT/OT Training. DT/OT Training for the RPV system will be presented to TRADOC personnel by Lockheed Missile and Space Company (LMSC) and Harris Corporation at the contractor facilities as outlined in para 7a of this plan.

(3) Instructor and Key Personnel Training. IKPT for RPV system will be conducted for CERCOM, TSARCOM and TRADOC instructor personnel by the contractor as outlined in para 7a of this plan.

(4) Non-resident courses of instruction. These courses of instruction will be developed/reviewed by proponent TRADOC schools for individual training programs as outlined in para 7g.

Figure III-46. Illustration of a Course Development Sub-Paragraph for a Training Concept Paragraph of an OICTP/ICT

A7.21.9 APPLICATION TO AN OICTP. At the time an OICTP is prepared, detailed information upon which to base the Training Concept paragraph may not be available. However, the general form of the training concept should be

known. It should be noted that the illustrations for activity A7 often begin with a general statement followed by detailed information. This detailed information can be omitted from the Training Concept paragraph of an OICTP.

A7.22 Fulfill Staffing Requirements

OVERVIEW

PURPOSE. An OICTP/ICTP is prepared by different elements within the proponent school. Also, inputs may be required of other schools. To ensure adequate preparation of an OICTP/ICTP all organizational elements which provided inputs to the document as well as other interested organizations must have an opportunity to review and comment of the draft OICTP/ICTP.

TSM/AO RESPONSIBILITIES. The AO is responsible for assuring that the draft OICTP/ICTP is appropriately staffed.

SOURCES OF ASSISTANCE. Staffing requirements are listed in TRADOC Circular 351-8 under paragraph 4, Responsibilities. The table contained in Appendix B or TRADOC Circular 351-8 indicates the various agencies that provide input to the OICTP/ICTP and/or who must have an opportunity to review and comment on the draft OICTP/ICTP. The ATSC is also available for assistance.

PROCEDURES

A7.22.1 COORDINATE DRAFT OICTP/ICTP. Send copies of OICTP/ICTP to all organizational elements that helped prepare OICTP/ICTP. Be sure copies are sent to all elements listed on Appendix B of TRADOC Circular 351-8 (see also Figure III-13, page III-80 of this handbook). Request that document be reviewed and returned within 20 working days.

A7.22.2 REVISE OICTP/ICTP. Make appropriate revisions to OICTP/ICTP on basis of reviewer comments.

A7.22.3 STAFF REVISED OICTP/ICTP WITH PM AND WITH HQ TRAINING PROPONENT. Request reviewing elements to concur in OICTP/ICTP or to provide appropriate revisions to document.

A7.22.4 SUBMIT OICTP/ICTP TO USATSC. "Proponents for new developing systems will submit an OICTP with the LOA and the ICTP with the ROC/LR, to HQ TRADOC (USATSC, ATTN: ATIC-DST, Fort Eustis, VA 23604)."

EVENT A8--ORGANIZATION AND OPERATIONAL CONCEPTS

OVERVIEW

Purpose

The purpose of this general category of activities is to define--as precisely as possible and as soon as possible--the impact the introduction of the new system will have on organization equipment, training, and personnel requirements, and to develop the organization and operational concepts to be used in the Concept Formulation Package (CFP).

Relation to LCSMM/IPS Events

Information developed during Event A8 activities provides input to one or more of the four studies conducted during preparation of the Concept Formulation Package. These studies are the Trade-Off Determination (TOD), the Trade-Off Analysis (TOA), the Cost and Training Effectiveness Analysis (CTEA), and the Cost and Operational Effectiveness Analysis (COEA). Information generated during Event A8 also is used to revise organization and operational concepts developed earlier in the LCSMM for the system. In turn, these concepts form the basis for the Provisional Qualitative and Quantitative Personnel Requirements Information (PQQPRI - Event B15, Page IV-59) and the Tentative Basis of Issue Plan (TBOIP - Event B16, Page IV-65).

TSM/AO Responsibilities

Event A8 activities require a coordinated effort of the PM, the proponent, the logistics-oriented school, LOGCEN, and the Soldier Support Center. The PM or the materiel developer is responsible for identifying any trade-offs that may be necessary and for assisting the proponent in resolving issues raised by trade-off requirements. The proponent is responsible for developing the organizational and operational concepts. Normally this is accomplished by the combat

developer (TRADOC) with assistance from the PM, logistics-oriented school, LOGCEN, and the Soldier Support Center as required. If issues cannot be immediately resolved, the PM is responsible for submitting these issues to appropriate agencies for study and evaluation. These studies are discussed under Event A11, Personnel Studies.

Phasing

All trade-offs must be resolved or submitted for further study during the conduct of the TOA and COEA. Trade-off issues usually are cited in the LOA, and the evaluation of these issues must begin as soon as the LOA is approved.

INPUT DATA/EVENT BASE

This event makes use of all system-related data and concepts generated to date. This information will be incorporated into or attached to the LOA. Information about training and personnel requirements will be contained in or attached to the OICTP for the system. These two documents, the LOA and the OICTP, will be available from the proponent school. Materiel effectiveness data and RAM (Reliability, Availability, Maintainability) data may be difficult to obtain and, in fact, may not exist for the developing system. However, RAM data for comparable systems can be obtained from the PM or from the materiel developer for the comparable system(s).

OUTPUTS AND END PRODUCTS

- a. Operational Concept (OC). The OC describes the role of the new system in force operations in combat and the interactions of the new system with the rest of the organization.
- b. Mission Profile (Revised). The revised mission profile is derived from the operational concept and consists of a list of operational tasks required of the unit, with the frequency and urgency for each, as well as the conditions affecting the performance (e.g., visibility, terrain, possible countermeasures).

- c. Other Studies. A significant output of efforts to determine an organization and operational concept will be the identification of issues needing resolution. Among them will be training issues, such as possible use of SPAs, costing of expendables (e.g., training ammunition, POL), or training device requirements. These issues will be designated for further study in accordance with AR 70-8, Personnel Performance and Training Programs.

REFERENCES

AR 70-8, Personnel Performance and Training Programs (PPTP)
AR 71-1, Army Combat Developments
AR 71-2, Basis of Issue Plans
AR 611-1, MOS Development and Implementation
TRADOC Pamphlet 11-8, Cost and Operational Effectiveness Analysis

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A8

This event involves a series of actions, and specifying a general methodological approach is therefore difficult. The basic purpose is to describe the impact that introduction of the new system will have on the present force structure. At a minimum the following questions must be considered:

- o How will it change the organization?
- o How will it be used?
- o How many people will be required to operate, maintain, and support it, and what MOSs will they have?
- o What are the training requirements?

Obtaining answers to such questions requires many separate and some coordinated evaluations. The coordinated evaluations--the TOD, TOA, BTA, COEA, and CTEA--are described under Concept Formulation Package (Event A9). The separate evaluations are less formal and not as well defined. They consist of such efforts as determining whether an operator can perform a critical task, can be

trained to perform the task, or can be assisted in performing the task, or whether the task must be simplified by design changes. This is the type of issue that the PM will designate as a trade-off study issue.

Trade-off issues need to be resolved before the TOA and COEA are conducted. Suppose, for instance, that the new system requires an operator to handle 500 messages an hour and it is not known whether he can or cannot do this. The interim solution would be to provide two or more concepts for evaluation--one assuming he can meet the requirement and another adding an assistant operator. A request is made for a study (see Event A11, Page III-212) to resolve the issue. The results are used in the next COEA (part of Event B20) and may be used to update the COEA information attached to the Outline Acquisition Plans (Event A10).

Many trade-off issues are complex and resolution is only partial, even after data are gathered at OT I. The purpose of the trade-off studies is to define the issues as accurately as possible and to plan for the contingencies. If it is not known whether an operator can process 500 messages an hour or whether he can be trained to do so, the option of using the operators must remain open and be examined during tests.

EVENT A9--CONCEPT FORMULATION PACKAGE (CFP)

OVERVIEW

Purpose

The Concept Formulation Package (CFP) presents the results of four evaluative studies performed to determine the Best Technical Approach(es) (BTA) to meet the stated objectives of the MENS. With respect to training and personnel, the CFP provides for the evaluation of alternative training and personnel support concepts and the selection of the best concepts. The CFP supplies the basic data needed to develop the Outline Acquisition Plan (Event A10).

Relation to LCSMM/IPS Events

The CFP is the product of four studies. The size of each study will depend on the number of materiel and personnel issues in need of resolution. Each issue may require a separate study. These studies are:

<u>Study</u>	<u>Responsibility</u>
Trade-Off Determination (TOD)	DARCOM
Trade-Off Analysis (TOA)	TRADOC/DARCOM
Best Technical Approach (BTA)	TRADOC/DARCOM
Cost and Operational Effectiveness Analysis (COEA)	TRADOC/CD

The studies are conducted sequentially. However, since the data base is being continually revised because of on-going materiel development, the individuals conducting the studies should be in constant contact. This contact is generally coordinated through the TSM/AO.

The IPS events pertinent to preparing the CFP are the Outline Individual and Collective Training Plan, Event A7, and Organization and Operational Concepts,

Event A8. Though these efforts do not directly become a part of the CFP, their inputs are critical to the COEA process. They must provide the best available estimates of the cost of training and the impact of that training on organizational structure and operations. This event corresponds directly with Event 8 of the LCSMM.

TSM/AO Responsibilities

The materiel developer is responsible for coordinating preparation of the CFP, preparing portions of the CFP, incorporating inputs from all sources into the draft CFP, and staffing the CFP with interested TRADOC and DARCOM agencies. Other responsibilities are as follows:

1. The TOD is conducted by the PM or materiel developer. The findings are forwarded to the TRADOC proponent.
2. The TOA is conducted by the proponent school (combat developer) with assistance from the Soldier Support Center, LOGCEN, and/or the logistics-oriented school. The findings are furnished to the PM/materiel developer.
3. The BTA is jointly prepared by the TRADOC proponent school (combat developer) and the PM/materiel developer.
4. The COEA and the supporting CTEA are prepared by the proponent TRADOC school combat developer and training developer respectively. Inputs relating to costs, and operation and support concepts are obtained from the materiel developer, LOGCEN, and the logistics-oriented school, as required. The TSM/AO assures that the findings of the CTEA/COEA are coordinated with other interested TRADOC agencies (see TRADOC Circular 351-8). In addition, the TSM/AO is responsible for coordinating the review and update of the COEA prior to each milestone

decision point for ASARC/DSARC and IPR systems throughout the acquisition cycle, and for ensuring that the COEA addresses appropriate NATO and other Services system alternatives (AR 71-9, Chapter 11).

Phasing

The evaluation of hardware design alternatives begins immediately after the LOA; simultaneously, the training alternatives must be examined. This begins with the development of alternative approaches to training the critical tasks determined in Event A6, proceeds to the development of the OICTP and the TSP (Training Support Plan), Event A7, and culminates in the performance of the CTEA in Event A9.

INPUT DATA/EVENT DATA BASE

- a. LOA -- output of Event A5.
- b. OICTP -- output of Event A7.
- c. Outputs of Event A8, including a revised Operational Concept, a revised Mission Profile, decisions/study findings resulting from investigations conducted as part of Event A8, Organization and Operational Concepts.

OUTPUTS AND END PRODUCTS

Accomplishment of the events leading to the CFP, Event A9, should result in all the outputs necessary to develop an acquisition plan:

- a. The Best Technical Approach(es) (BTA).
- b. A cost effectiveness comparison of the BTA and the baseline system.
- c. Issues, including personnel and training issues, yet to be resolved.
- d. Organizational and operational concept(s).

These outputs are the basis for developing the Outline Acquisition Plan (OAP), Event A10. The analyses described, together with other material and personnel studies in Event A8, provide the information the ASARC/DSARC need to reach a decision on whether to continue the program. Additionally, the COEA and supporting CTEA produced for the CFP form the basis for all future COEAs and CTEAs of the same system.

REFERENCES

AR 11-18, Army Programs--The Cost Analysis Program
AR 71-9, Materiel Objectives and Requirements
DARCOM Regulation 11-27, Life Cycle Management of DARCOM Materiel
TRADOC Regulation 11-8, Cost and Operational Effectiveness Analysis
TRADOC Regulation 351-4, Training Effectiveness System Management
TRADOC Pamphlet 11-8, Cost and Operational Effectiveness Analysis
TRADOC Pamphlet 71-8, Analyzing Training Effectiveness
TRADOC Pamphlet 71-10, Cost and Training Effectiveness Analysis Handbook
TRADOC-DARCOM Guide, Management and Control of COEA Cost Data
TRADOC-TACFIRE CTEA

EXAMPLES AND ILLUSTRATIONS

The format for the Concept Formulation Package (CFP) is shown in Figure III-47. It is from AR 71-9, Appendix H.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A9

The process leading to the preparation of a Concept Formulation Package is best characterized as a continuing evaluative effort of the hardware and personnel issues that lead to a comparison of the Best Technical Approach(es) with existing conditions. At certain interim milestones, these continuing evaluative efforts must provide input to other evaluations.

Trade-Off Determination (TOD)

The TOD is an evaluation of the design alternatives and of the various support concepts associated with each alternative. Its goal is to reduce the design/support alternatives to a minimum. The TOD document must convey the apparent technical risks associated with each approach, estimated RDTE, and procurement costs and schedules. During this activity the training developer

should be in constant contact with the P11/materiel developer, as any design addition or changes may affect TOD considerations.

Trade-Off Analysis (TOA) and Best Technical Approach (BTA)

A TOA is conducted for the concepts remaining after the TOD is completed. The goal is to identify which technical approach(es) offered in the TOD are best. The TOA findings are furnished to the PM or materiel developer who then, in cooperation with the combat developer, determines a Best Technical Approach. This selection is based on the results of the TOD and TOA, and on an analysis of tradeoffs among integrated logistical support concepts, technical concepts, life cycle costs, and schedules. The goal of the BTA is to identify a cost-effective approach capable of providing the highest combat performance.

There are numerous methodologies for TOAs, but most fall under the general categories of simulations and war games. Simulations generally provide the same results (expected values) when performed twice with the same data. On the other hand, war games, since they involve decision making processes, may not yield the same results from the same basic data. Therefore, when war games are used, conclusions should be based on several games, and expert interpretation of the decision making process should be included as part of the analysis. This expert interpretation determines whether increases or decreases in combat effectiveness were the result of a decision made during the war game or were caused by the system itself. The end result of this analysis is the BTA, determined jointly by the materiel developer and the combat developer at the STF/SSG level.

Cost and Operational Effectiveness Analysis (COEA)

The COEA is performed by the combat developer and the TRADOC Systems Analysis Agency, with training developer assistance in the form of a CTEA

(discussed below). The basic methodology used for the COEA should be similar to that used for the TOA, with the output being the cost effectiveness of the system rather than just the combat effectiveness.

There may be more than one BTA, one for each competing system concept. Therefore, the cost effectiveness of each BTA versus a "baseline" system and/or current operational conditions must be displayed. The objective is to determine whether combat effectiveness can be increased by deploying the new system either at the same cost or at an allowable increased cost, or whether the same effectiveness can be achieved for a lower cost.

Cost data for major Army systems are obtained from the Office of the Comptroller of the Army, Directorate of Cost Analysis, under TRADOC Regulation 11-8.

Cost and Training Effectiveness Analysis (CTEA)

The training developer's major contribution to the CFP is the training cost estimate input to the COEA. This is obtained by performing a CTEA using the information developed in the OICTP (Event A7). An OICTP should be developed for each BTA chosen, and the cost of implementing the plan should be determined and compared with present and projected baseline costs.

The methodologies for performing a CTEA are not yet as well defined as those for performing COEAs. Several efforts are under way at ARI and TRASANA to provide more sophisticated methodologies and to highlight previous problem areas by providing sample cases of previous efforts.

For assistance contact TRASANA or the Army Training Support Center, ATIC-DST-PA.

FORMAT FOR CONCEPT FORMULATION PACKAGE (CFP)

The Concept Formulation Package will be organized as described below and, as a minimum, will include the information indicated below. The detail and volume of the CFP will be simplified as appropriate to the complexity of the issues addressed and to the cost of the subject materiel.

a. Covering Letter. Letter including the following:

(1) An introduction that describes the purpose of the package, how it is organized, and the magnitude of effort required to satisfy objectives of concept formulation.

(2) A description of the system(s) (what the system is; what it is intended to do; threat environment in which it will operate; performance characteristics; new or unusual features; life cycle cost estimates; estimation of manpower requirements; systems being replaced; and competing systems). For tactical Automated Systems (TAS) a description of interoperability (and supporting communications requirements, continuity of operations (CONOPS) provisions, security requirements, and performance standards of hardware and software to which the system will adhere, and reliability, availability, and maintainability (RAM) requirements must be included.

(3) Needs and limitations affecting results and conclusions provided in the appendixes (e.g., unusually stringent performance characteristics, surety aspects, fiscal guidance and funds availability, urgency of need, and requirement to accelerate development).

b. Trade-Off Determination (TOD) appendix (prepared by the materiel developer).

(1) Description of the individual technical approach(es), including consideration of proposed product improvement and procurement of non-developmental systems (e.g., commercial, other Service, other nation) as an alternative to new development.

(2) Evidence that the proposed technical approach(es) is engineering rather than experimental, with an indication of the technical risks.

(3) Enumeration of trade-offs required for the suggested approach(es).

(4) Estimated life cycle costs and scheduling estimates as related to acquisition of the item.

(5) The recommended technical approach (including technical analysis or trade-offs, risks, capabilities needed, costs, schedules, integrated logistic support requirements, estimated total Army manpower requirements, and environmental and ecological factors inherent in the technical approach(es).

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Figure III-47. Format for Concept Formulation Package (CFP)
(AR 71-9, Appendix H)

c. Trade-off Analysis (TOA) appendix (prepared jointly by the materiel developer and the combat developer).

(1) Mission and Performance Envelopes (MPE) with justification and rationale.

(2) Analysis of system trade-offs, risks, capabilities, estimated total Army manpower requirements, costs, schedules, and logistic support.

(3) Selection of the best approach(es) from an operational and integrated logistic support aspect and establishment of environmental and ecological factors that must be faced by the Army in fielding the system.

d. Best Technical Approach (BTA) (prepared jointly by the materiel developer and the combat developer).

(1) Description of the Best Technical Approach and integrated logistic support concepts based on the results of the TOD and TOA.

(2) Evidence that the proposed Best Technical Approach is an engineering process rather than an experimental process.

(3) Estimated cost (RDT&E, OMA, MCA), estimated total Army manpower requirements, procurement and scheduling estimates.

(4) Recommendation as to whether the development should be project managed.

(5) A Draft Environmental Impact Statement will be included in accordance with Appendix I.

e. Cost and Operational Effectiveness Analysis (COEA) appendix (prepared by the combat developer).

(1) Costs.

(a) The costs for each COEA alternative should specify what costs are included as defined by the Key Cost Categories.

(b) Hardware should be specified by quantity and Life-Cycle-Acquisition cost in each COEA alternative.

(c) Costs of specific concern to the combat developer: Training costs, ILS and Force Costs, should be presented separately. Other costs not included because of wash-out effects, sunk or unknown should be noted in the text.

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Figure III-47. Format for Concept Formulation Package (CFP)p

(AR 71-9, Appendix H)

(Continued)

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(d) Application of cost categories should be appropriate to each COEA alternative, so that none is biased.

(e) COEA alternative costs may be represented by cost differences between the specific action alternatives and the baseline case. Note that these costs are used for decisions that may affect budgeting, but are not figures that can be used directly in the budget.

(2) Operational effectiveness. Operational Effectiveness will be quantified to the greatest extent possible in terms of measures of effectiveness of the force in which the new system is included. Where data or techniques do not permit quantitative analysis of all important system aspects, such as reliability, availability, and maintainability (RAM), electromagnetic capability, logistics, and realistic battlefield environmental conditions, a qualitative evaluation should be used to expand the quantitative assessment.

(3) Cost effectiveness. The candidate systems are structured into COEA alternatives, defining fielding alternatives for the candidates, including combinations of them if appropriate. These action alternatives are then contrasted to the baseline alternative (status quo), by ranking through cost effectiveness or relative worth ratios, modified by experience and military judgment where appropriate.

(page 3 of 3)

Figure III-47. Format for Concept Formulation Package (CFP)
(AR 71-9, Appendix H)
(Continued)

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EVENT A10--OUTLINE ACQUISITION PLAN (OAP)

OVERVIEW

Purpose

The Outline Acquisition Plan (OAP) is the planning document used to support entry of all developmental programs into the Validation Phase of the LCSMM in those instances where a Required Operational Capability (ROC) or other materiel requirement document has not been approved. The OAP contains a definitive plan for managing the advanced development effort needed to achieve the Materiel Objective(s) addressed by the LOA for the system. In addition, the OAP analyzes technical options and plans for the development phase of a system's ROTE program before a firm requirement is initiated by means of a ROC document or a Letter Requirement (LR).

With respect to training, the OAP identifies training milestones, training requirements including SPAS needs, and training test issues. Also, the OAP identifies personnel test issues, special personnel requirements, and the numbers and type of personnel needed to support the system under development.

Relation to LCSMM/IPS Events

The OAP, Event A10, uses inputs from all preceding Phase I events. In particular, the OAP is based on data and concepts in the CFP (Event A9) and the OICTP (Event A7), and on the document(s) produced during Event A8, Organization and Operational Concepts. Inputs from Personnel Studies (Event A11) also are used in the OAP. OAP preparation is scheduled in accordance with the PM's master schedule for system development. The document must be completed before the ASARC/DSARC/IPR scheduled for Phase I of the LCSMM. When approved, the OAP provides the basis for all subsequent events through DT/OT I. Event A10 corresponds directly to Event 9 of the LCSMM.

TSM/AO Responsibilities

The materiel developer normally is responsible for developing the OAP, keeping it current, coordinating the draft OAP with interested agencies, and distributing the updated OAP before each milestone. For major systems HQDA may require a Special Task Force/Special Study Group (STF/SSG) to produce a final report for the use of the materiel developer in preparing the OAP. The body of the OAP is composed of six sections, each with different preparation and coordination requirements (described under the General Procedures section for this Event).

Phasing

As noted, the OAP is prepared to fit into the master schedule for system development. It must be completed and staffed before this scheduled review of activities (i.e., Phase I IPR/ASARC/DSARC). The events leading to the OAP, other than the evaluative studies incorporated in the CFP, consist of a series of personnel studies, as needed (AR 70-8). These studies should begin as soon as the issues are identified and should continue throughout system development, if needed. These studies must provide "best available" estimates for incorporation into the OAP, along with issues remaining to be resolved, and recommended methods of resolution.

INPUT DATA/EVENT DATA BASE

During OAP preparation, maximum use is made of all existing system-related documents that contain the necessary information. The TSM/AO uses the updated OICTP and the updated training concept and requirements, as described in the CTEA/COEA report(s) attached to the CFP. These materials are prepared and

revised by the proponent TRADOC school. Additional information for use in personnel studies can be obtained from the MILPERCEN, the Soldier Support Center, and LOGCEN.

OUTPUTS AND END PRODUCTS

The output document contains the materiel system concept agreed upon by the materiel and combat developers. It records program decisions and appropriate analysis of technical options. It provides plans for development of the materiel system and its supporting subsystems (training, personnel, and logistics) during the Validation Phase of the LCSMM. It describes required follow-on actions and contains a management plan and a schedule for accomplishing these actions.

REFERENCES

AR 70-8, Personnel Performance and Training Programs (PPTP)

AR 70-27, Outline Development Plan/Development Plan

AR 71-2, Basis of Issue Plans

AR 700-127, Integrated Logistic Support

DARCOM Pamphlet 700-9-1, Guide for Integrated Logistic Support During the Conceptual Phase

ARI TR-78-A7, TSM Guide to Training Development and Acquisition of Major Systems

EXAMPLES AND ILLUSTRATIONS

The procedures and outline of the OAP can be obtained from AR 70-27 and AR 700-127.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A10

The materiel developer prepares the OAP in accordance with AR 70-27 and AR 700-127. The document contains six sections:

- Section I System Concept Summary

Section II	System Concept Requirements and Analyses
Section III	Plans for System Concept Development
Section IV	Coordinated Test Program
Section V	Plan for Personnel and Training Requirements
Section VI	Plan for Logistic Support

The content of these sections is summarized in the following paragraphs along with the responsibilities of the combat and materiel developers (the information has been extracted from AR 70-27):

Section I, System Concept Summary. This section will contain the LOA, any implementing instructions that may be issued by HQDA or the materiel/combat developer, and any approved Army Program memorandum (APM), Defense Program Memorandum (DPM), or Decision Coordinating Paper (DCP). Section I will be prepared by the materiel developer in coordination with the combat developer, trainer, developmental and operational testers, and logistician.

Section II, System Concept Requirements and Analyses. This section will contain the system concept, as agreed upon in the LOA, and any additional information available that will assist in defining the concept. It will include the CFP and the organizational and operational concepts. Section II will be developed jointly by the combat and materiel developers. It will be prepared as early as possible and will be made available to the logistician, developmental and operational testers, and the trainer to guide their participation in preparation of other portions of the OAP.

Section III, Plans for System Concept Development. This section will consist of tasking and supporting plans for investigating materiel system(s) representative of the approved materiel system concept(s). The plans will establish

the interface required of all participants during the advanced development effort, and will contain an event-oriented and time-phased milestone schedule. Section III will be prepared by the materiel developer in coordination with the combat developer, trainer, developmental and operational testers, and logistician.

Section IV, Coordinated Test Program (CTP). This section will be a coordinated plan for all testing in support of the advanced development investigation, and will include, to the degree practicable, plans for follow-on developmental and operational testing. The TSM/AO will be required to identify critical training and personnel issues for testing, and to provide criteria against which DT/OT I tests will be designed and the data evaluated. Section IV will be prepared by the materiel developer in coordination with the combat developer, trainer, logistician, and developmental and operational testers.

Section V, Plan for Personnel and Training Requirements. This plan will include identification of skills, individual and crew training requirements, training devices, training facilities, and associated schedules necessary to conduct advanced development investigations. Section V will be prepared by the materiel developer in coordination with the combat developer, trainer, logistician, and developmental and operational testers. In actuality, this section in many cases is prepared jointly by the combat developer and training developer, using information contained in the updated OICTP.

Section VI, Plan for Logistic Support. This section will contain a broad general plan for logistic support during the advanced development investigations, including milestones for verification. It will also include identification of alternative support concepts; anticipated critical supportability issues (to include those for testing); recommended reliability, availability,

and maintainability objectives; life cycle support cost goals, anticipated logistic environment; and a plan of action for the Validation Phase logistic effort. Section VI will be prepared by the materiel developer in cooperation with the logistician, combat developer, developmental and operational testers, and trainer.

EVENT A11--PERSONNEL STUDIES

OVERVIEW

Purpose

The purpose of these studies is to conduct research on unresolved training or personnel issues identified during concept formulation for the proposed system. The studies form part of the U.S. Army Personnel Performance and Training Program (PPTP) and must conform to the guidelines established for the PPTP. The "overall goal of personnel performance and training RDTE is to develop, apply, and exploit scientific knowledge that improves operational practice and procedures" in the following areas: personnel and management systems, education and training systems, and human factors in system development and operation (AR 70-8).

Relation to LCSMM/IPS Events

Personnel studies are developed from the issues designated in the LOA (Event A5) or the CFP (Event A8) as needing further research. These studies can begin at any time after the initial organizational, personnel training, and logistic evaluations have identified the issues to be studied and the OAP (Event A10) has been approved. The OAP will provide the data necessary for the studies to be included in the RDTE package under the PPTP.

TSM/AO Responsibilities

The TSM/AO should monitor the updating of training development requirements and the OICTP. These activities will normally be performed by the training developer at the proponent TRADOC school. The TSM/AO may also coordinate the acquisition of basic data necessary for personnel trade-off studies from MILPERCEN, the Soldier Support Center, and LOGCEN as required. The study

program is executed through two developing agencies, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) and the Human Engineering Laboratory (HEL), but these studies are carried out in close coordination with the system proponent and the above mentioned agencies (MILPERCEN, etc.). The TSM/AO will assist the training or combat developer in preparing a Human Research Need (HRN) advisory statement. This statement, submitted to DCSPER, serves as a formal request for research on a personnel or training problem.

Phasing

Phasing of the personnel-related studies becomes important because of the continuous updating of these studies and the necessary interchange of basic data and results. The phasing problem is two-fold.

First, cut-off dates are necessary; at those times "best estimates" are provided to the next study and/or the research sponsor. The research then continues to its conclusion. Accompanying the "best estimates" must be a listing of the issues remaining to be resolved and a plan for their resolution. This information is incorporated in the acquisition and test plans for the system.

Second, because the proponent research agency (usually ARI or HEL) is required to study many systems, it must have advance notice of when a particular study is to be performed. The agency may develop its study schedule as much as two years in advance and, with limited analytical resources and RDTE fundings, sets priorities on milestones and amounts of effort for each. To insure adequate lead time, the TSM/AO should anticipate, if possible, the training issues that will require study, discuss these requirements with the training developers and proponent research agency, and submit a HRN statement.

INPUT DATA/EVENT DATA BASE

- a. Research Issues. The research issues are developed from the initial evaluations performed to determine the organizational, personnel, training, and logistic requirements of the new system. They should be well documented in the COEA and TOA sections of the CFP.
- b. Basic Data. Basic data to perform the research can come from many sources. The best initial source is any recent similar effort that may be available from ARI or from the Training Developments Directorate of the proponent school.

OUTPUTS AND END PRODUCTS

TRADOC is responsible for applying the RDTE results to training. This can be accomplished through the TSM/AO for a particular system. The output of any research will be used to revise the OICTP/ICTP and OAP as appropriate and to provide additional information for the next CTEA update.

REFERENCES

- AR 5-5, The Army Study System
- AR 70-1, Army Research, Development, and Acquisition
- AR 70-8, Personnel Performance and Training Programs (PPTP)
- AR 70-55, Management of U.S. Army Research and Development Center and Laboratories
- AR 602-1, Human Factors Engineering Program
- DA Pamphlet 5-5, Guidance for Study Sponsors and Study Advisory Groups

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A11

Personnel Studies, as described by AR 70-8, Personnel Performance and Training Programs, is a broad area. The emphasis is on human factors in system development and operation but the program also includes personnel and management systems, and education and training systems.

Studies in the training area include the training of individuals and units and involve improving methods of developing, delivering, conducting, and evaluating training. The areas requiring study may have been identified during the development of the LOA or OICTP or during the conduct of the CTEA. These areas for further study are listed in the CFP.

Personnel studies also may include RDTE on simulation and training devices. The research will indicate the concept or approach for designing the training device to ensure maximum compatibility with the overall training requirements. The concept will then be supported by a CTEA. The requirement for a simulator or training device may require the initiation of a Training Device Requirement (TDR) document.

The methodologies used for these studies are too numerous to discuss here. They are the result of the continuing research of ARI, HEL, and other agencies and are generally specific to the type of problem being solved. They were developed for such efforts as selecting appropriate training media for critical tasks, assessing trade-offs of machine versus human functions, and structuring organizations for optimum personnel utilization. TRADOC is responsible for determining the issues; ARI and/or HEL is responsible for choosing the appropriate methodology.

EVENT A12--ASARC I DSARC I/IPR

OVERVIEW

Purpose

The Army Systems Acquisition Review Council (ASARC), the Defense Systems Acquisition Review Council (DSARC), and the In-Process Review (IPR) held by the proponent command are groups of top managers meeting to decide the future course of action in the acquisition of new systems. The number and level of the meetings -- command, Army, and Defense -- are a function of the importance and cost of the system (AR 15-14).

Relation to LCSMM/IPS Events

The Outline Acquisition Plan, Event A10, contains the information necessary for the review process. If approval is received at each necessary review, the OAP, with the suggested modifications, if any, will become the basis for the prototype contract. This event corresponds directly to Event 14 of the LCSMM.

TSN/AO Responsibilities

The TRADOC representative will be a member of an ad hoc working group formed approximately 11 months before the scheduled ASARC. This group will determine the issues requiring resolution prior to the ASARC. The TSN/AO must insure that the issues determined in the areas of logistics, personnel, and training are forwarded to the appropriate agencies for resolution. He will be required to prepare and present a briefing on these issues, if requested, at the ASARC meeting.

Phasing

Approximately 4 to 6 months before a scheduled milestone (I, II, or III) decision for an OSD major system, the DSARC will initiate action to request a

milestone meeting. Approximately 11 months before a scheduled ASARC, the ad hoc planning meeting will be held. An agenda for the ASARC will be established as an enclosure to the ODCSRDA guidance directive in accordance with AR 15-14.

INPUT DATA/EVENT DATA BASE

Output of Event A10.

OUTPUTS AND END PRODUCTS

- a. ASARC/DSARC/IPR Review. A decision to continue to the Demonstration and Validation Phase by issuing a prototype contract.
- b. Study Issues. Identification of further personnel and training issues deemed important enough for resolution prior to Milestone II but not critical enough to justify withholding a decision to proceed to the DVAL phase.

REFERENCES

DODD 5000.1, Major System Acquisition
DODD 5000.2, Major System Acquisition Process
DODD 5000.26, Defense Systems Acquisition Review Council (DSARC)
AR 15-14, Systems Acquisition Review Council Procedures

EXAMPLES AND ILLUSTRATIONS

See AR 15-14. The checklist for Milestone I Reviews (Appendix A) is reproduced here as Figure III-48.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT A12

Guidance on preparing for the review procedures is provided by DODD 5000.2 and AR 15-14. Prior to an ASARC, a preliminary review will be held to clearly define the major issues and ensure that an ASARC is necessary at that point in system development. This preliminary review is generally held one month before the ASARC. The issues to be addressed are, of course, specific to the system being reviewed but a general agenda will be followed for most meetings:

- o Mission Element Need
- o Threat Assessment
- o Operational Concept
- o Standardization/Interoperability
- o COEA
- o Technical Assessment
- o Integrated Logistic Support (ILS)
- o Test Planning
- o Cost
- o Other Issues

Most of the information needed by the decision makers will have been generated for the OAP in the form of the TDA, the TOA, the COEA and supporting CTEA, and the supplemental studies of personnel issues. However, there are usually issues specific to the system, on which the STF/SSG or ASARC will require responses such as:

- o What is the sensitivity of the system plan to changes in the projected threat?
- o What is the effect on training requirements for the system created by the all volunteer Army?

These questions should be formulated as early as possible by the STF/SSG so that they may be included as Essential Elements of Analysis (EEA) in the TOA, COEA, or CTEA. If they are not raised as issues until the preliminary ASARC is held, the formal ASARC may be delayed until they are resolved.

APPENDIX A

CHECKLIST FOR MILESTONE I REVIEWS
(END EXPLORATION OF ALTERNATIVE SYSTEM CONCEPTS PHASE,
BEGIN DEMONSTRATION AND VALIDATION PHASE)

The following items will be reviewed at Milestone I:

a. Need. The mission element task is reaffirmed to be essential.

b. Threat. The threat is credible, addresses the correct timeframe, has been validated by CG, INSCOM, in coordination with ACSI and, when appropriate, by DIA.

c. System alternatives:

(1) Satisfy the mission element need(s).

(2) Adequately reflect the technology base.

(3) Provide an acceptable competitive environment.

(4) Consider:

(a) Existing military and civilian equipment.

(b) Use of available sub-systems.

(c) Product improvement of existing systems.

(d) Foreign and other services' systems.

(5) Provide for service and NATO standardization and interoperability.

(6) Ensure joint service, interoperability, and multinational considerations are adequately treated in the planning.

(7) Include environmental considerations (DODD 6050.1).

(8) Ensure COEA support system(s) selected for demonstration and validation.

d. Operation Factors

(1) Cost performance tradeoffs.

(2) Electromagnetic compatibility.

(3) Vulnerability to EW/SIGINT.

(4) Minimum operating personnel.

e. Logistical Factors.

(1) Minimum O&S costs.

(2) Minimum maintenance and support personnel.

f. Acquisition Strategy. Ensure it is complete, effectively integrates the program technical, business, and management elements and supports the achievement of program goals and objectives.

(1) Short-and long-term business planning effectively supports the acquisition strategy.

(2) Producibility and production risk considered.

(3) Competition maximized.

(4) Contractor structures; types of contracts.

g. Constraints.

(1) Established program constraints are still valid.

(2) Projected characteristics (including projected resource investment) consistent with established restraints.

h. Risk. Areas of risk and uncertainty identified and adequately treated in planning.

i. Testing.

(1) Issues to be addressed.

(2) Adequacy of planning and scheduling for preparation of the Coordinated Test Program (CTP).

j. Program Management Structure.

SECTION IV

LCSMM MODEL:

DEMONSTRATION AND VALIDATION (DVAL) PHASE

Overview

The purpose of Phase II of the LCSMM is to demonstrate and validate the materiel concept developed during Phase I and to formulate solutions to problems identified in the Outline Acquisition Plan (OAP). Phase II is also concerned with demonstrating, validating, and refining the logistics support concepts developed during Phase I. This includes the plan for training personnel to operate and maintain the system.

This section describes the major events that comprise Phase II. The relationship between these events is shown in Figure IV-1.

Scope

During the early portions of Phase II, the training developer concentrates on "high-risk" training tasks. Using task and skill analysis he identifies a set of high risk tasks for which training will be provided in preparation for Operational Test I. The materiel developer will assure that appropriate draft training and technical material is prepared. The training developer also will prepare draft training material, as agreed upon with the materiel developer, in the form of draft Field Manuals, tactical training guidance, ARTEPs, and Soldier's Manuals for high-risk tasks associated with tactical deployment. The actual training of operators and maintenance personnel for OT I usually is accomplished by the contractor.

Much of Phase II is devoted to planning for, conducting, and evaluating the results of DT/OT I. The training developer will be represented on most planning

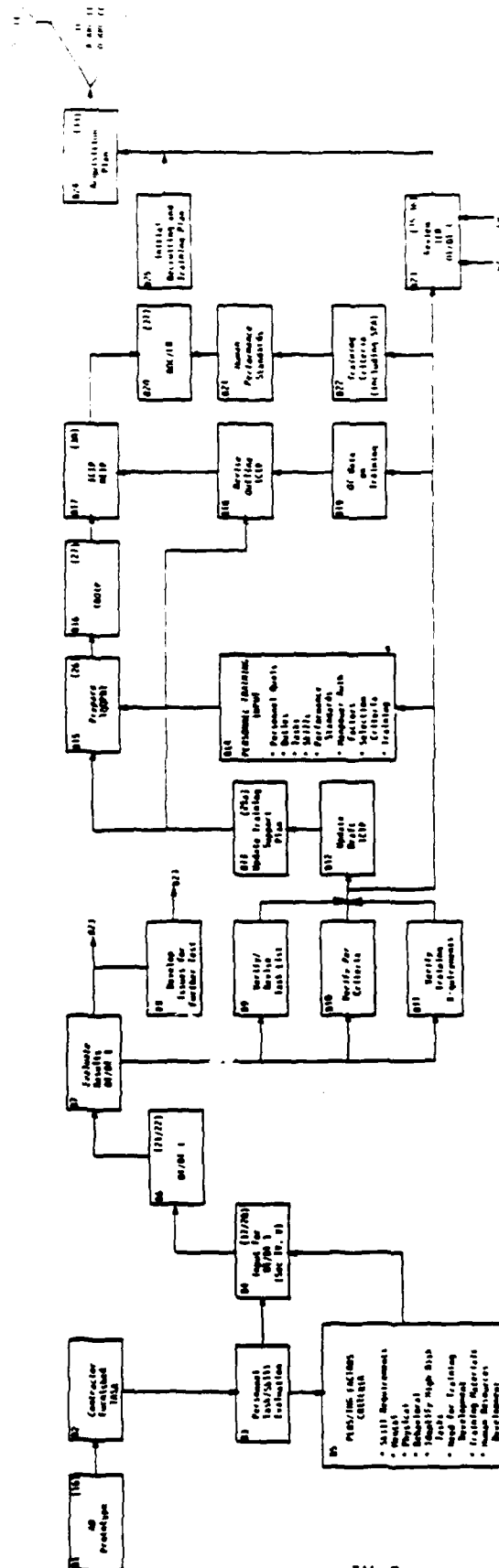


Figure IV-1. LSCM Phase II Events

committees and will be responsible for developing critical test issues related to the training problems developed during Phase I and refining plans for testing these issues.

Following OT I, the training developer prepares a position paper on the effectiveness of the training for the OT. He has the option of expanding this paper into an Independent Evaluation Report (IER).

On the basis of OT I results, the training developer devotes the remainder on Phase II to updating and refining the Outline Individual and Collective Training Plan (OICTP) and converting the OICTP to the ICTP. These plans are incorporated into the Required Operational Capability (ROC) or Letter Requirement (LR), and the Acquisition Plan (AP).

The major Phase II IPS events are shown in Figure IV-1 and in the Phase II chart in the back of this handbook. For additional information on Phase II events and their relation to LCSMM, see the DARCOM-TRADOC Handbook, Technical Documentation and Training Acquisition, TRADOC Circular 351-8, and ARI TR-78-A7.

Discussion of Events

EVENT B1--ADVANCED DEVELOPMENT PROTOTYPE CONTRACT

OVERVIEW

Purpose

The purpose of Event B1 is to update the Outline Acquisition Plan (OAP), issue a Request for Proposal (RFP), and choose a contractor(s) for the Phase II, Demonstration and Validation (DVAL). This event includes the following steps:

- a. Submitting the Determination and Funding (D & F) for Secretarial approval.
- b. Tailoring the RFP to assure that only essential data and reports are requested for the Advanced Development Prototype contract.
- c. Announcing the source selection and contract award.

Relation to Other LCSMM/IPS Events

The Advanced Development (AD) Prototype contract is a direct output of the OAP and any revisions and updates required by the ASARC/DSARC/IPR (Event A12). Event B1 is comparable to Events 15 and 16 of the LCSMM.

TAO/AO Responsibilities

The materiel developer has overall responsibility for preparing the RFP, awarding the contracts, and monitoring the developmental contract(s).

The TSM/AO is responsible, and has joint sign-off authority, for training developments and other support subsystem inputs to the RFP. The proponent organizations (e.g., combat developer and proponent school) prepare the specifications to ensure their completeness before submitting them to the materiel developer. The TSM/AO coordinates specifications for front-end analysis (FEA) and skill performance aids (SPAs) with the logistics proponent, training device specifications with the training device developer, and specifications for embedded training and test equipment with the materiel developer.

The TSM/AO is responsible for the development of "in-house" specifications for the Outline Individual and Collective Training Plan (OICTP) and for the validation and verification of developmental products.

The TSM/AO establishes, through the materiel developer, liaison with the training development contractor.

Phasing

As with many earlier events, the phasing is system-specific. The event should, however, be undertaken as soon as possible after the SARC decision to proceed with the project. Simultaneous contractor selection and contract award are preferable, as described in Army Pamphlet 11-25, but this is not always possible.

INPUT DATA/EVENT DATA BASE

The training input data requirements for the contract are the latest available information on the training issues involved, from Events A10 and A11 (pages III-206 through III-211). There may be a requirement, designated by the review process, for an updated COEA and CTEA prior to the contract. This however, would be system specific.

OUTPUTS AND END PRODUCTS

- a. Outline Acquisition Plan Update. This consists of any update to the OAP by the combat developer, trainer, logistician, and operational tester. These updates/revisions may be in response to recommendations made during the ASARC/DSARC/IPR, or may reflect the most recent concept of the materiel. The updated OAP is prepared as soon as possible after SECDEF approval of the OAP. This is a request for proposals from contractors to implement the full-scale engineering development phase. The RFP describes the functional requirements of the system and its support subsystems. The RFP is prepared as soon as possible after SECDEF approval of the OAP.

- b. Request for Proposal (RFP) from (Event A12). This is a request for proposals from contractors to implement the demonstration and validation phase. The RFP describes the functional requirements of the system and its support subsystems. The RFP is prepared as soon as possible after SECDEF approval of the OAP.
- c. Contract for Advanced Development Prototype. This is a contract between materiel developer and selected contractor(s) for the advanced development prototype(s). It is based on a review of proposals in response to the AD RFP. The contract must assure that the training developer has access to TASA (task and skill analysis) data developed during the early stages of the contract.

REFERENCES

AR 715-6, Proposal Evaluation and Source Selection

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B1

Guidance on the issues to be resolved in developing the RFP is well documented in ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems, which is paraphrased here. Specifications for training development are derived from the requirements described in the IAP and outline the work to be accomplished by the developmental contractors.

Training developments are to occur on two levels during the Validation Phase:

- a. Training materials and Skill Performance Aids (SPAs) are to be provided at Operational Test/Development Test I for high-risk training tasks.
- b. Analyses and training requirements for other (low risk) tasks will proceed sufficiently to access operator/maintainer capabilities for OT/DT I.

Also, components that are expensive and require a long lead time (e.g., simulators) are to be developed and provided (in at least "breadboard" form) for OT/DT I, as are embedded test equipment and embedded training.

A key to the scope of work required during validation development is the accuracy of the high-risk task list provided in the specifications. Provisions

must be made in the contract for revising and refining this list early in the contract stage as the contractor proceeds with early analysis. To accomplish this, the contract must assure interaction among training developers and the contractor. Some systems may have the contractor of the training developer of the training material, but a requirement remains for interaction by the TSII/AO to monitor the training development process.

A background section describing what is necessary during validation is required in the RFP. The role of OT/DT I is primarily to insure that developmental products have achieved their stated goals. The "increased emphasis on testing" dictates that provisions be built into the developmental cycle to insure that individual products are thoroughly validated before they are submitted for overall system operational testing. Procedures and facilities (e.g., proving grounds, laboratories) are well established for DT of hardware components. The same capability does not exist for testing and evaluating other subsystems (i.e., the training subsystem), so procedures should be established and resources identified as part of the developmental effort.

Test and validation requirements that are to be met by the contractor should be made part of the training input to the RFP. Areas of concern include the following:

- a. Specifications for developing or revising the OICTP should be prepared. Although this is mainly an in-house activity, the OICTP is a "product" to be evaluated at OT/DT I. The specifications for development/revision will permit its progress to be monitored by the parties responsible for making sure it is developed.
- b. Training (and other support subsystems) developers should plan an active role in the evaluation of proposals. They should make recommendations for contractor selection based on the quality of the proposal and the qualifications of contractor personnel to perform the front-end analysis (FEA) and training development. Criteria for evaluating proposals should be prepared.

- c. Following contract award, the TSM/AO will need to maintain close coordination with the contractor to:
- (1) Make certain the contractor is included in the flow of information.
 - (2) Monitor progress of developmental activities.
 - (3) Participate in validation and verification of products.

Although overall contract responsibilities reside with the materiel developer, it is a TSM/AO function to provide quality assurance monitoring for training developments. The TSM/AO has joint sign-off authority over training development products.

Specific guidance on Army procurement procedures is provided in AR 715-6. TRADOC provides documentation on standard paragraphs for use by the TSM in the RFP to incorporate the above issues.

EVENT B2--CONTRACTOR-FURNISHED TASK AND SKILL ANALYSIS (TASA)

OVERVIEW

Purpose

During the Conceptual Phase a gross functional and task analysis was conducted (Event A3). On the basis of this analysis, estimates of personnel and training requirements were developed and incorporated into the Letter of Agreement (LOA, Event A5). The estimates were refined during the activities in Event A6 (Task Listing) and then used to develop an Outline Individual and Collective Training Plan (Event A7). The Task and Skill Analysis (TASA) estimates, the OICTP, and the accompanying Training Support Plan (A7) were all subject to examination and revision on the basis of personnel studies (A11) and COEA and CTEA studies (A9). The resulting refined estimates of personnel and training requirements were then incorporated into the Outline Acquisition Plan (A10).

The estimates used in the events described were based on an equipment concept and must be verified by comparing them with estimates based on the actual materiel. This is initially accomplished by the contractor during Event B2 and then verified by the materiel developer and the training developer during Event B3.

During Event B2 the contractor prepares TASA data for each operator, maintenance, and other support position associated with the new materiel. In addition, the contractor identifies the mental, physical, skill, and attitudinal requirements associated with each task, and examines training device requirements. Tasks identified as "high-risk" training tasks are emphasized.

Relation to Other LCSM/IPS Events

The contractor-furnished TASA data provide inputs to most of the training- and personnel-related events during the Validation Phase.

TSII/AO Responsibilities

The TASA data are generated during execution of the Logistic Support Analysis (LSA) program, which is a materiel developer responsibility. However, the training developer must carefully monitor the output of this program to assure that appropriate data are provided on high-risk tasks.

Phasing

The training developer must have access to TASA data at least 18 months before OT I. The contractor may wish to revise or add to the data in the intervening period.

INPUT DATA/EVENT DATA BASE

The AD Contract RFP (from Event B1) states the requirement for a task and skill analysis for all tasks performed by system operator and support personnel. As an aid to the contractor, the list of high-risk tasks if developed during Event A6 will be attached to the RFP.

OUTPUTS AND END PRODUCTS

- a. LSA Program Reports and Records. These reports and records contain the TASA and other data for all operator and maintenance tasks, as described in AR 700-127 and MIL-STD-1388. These data provide basic input to all training and personnel-related activities during the DVAL Phase. Draft TASA material should be available about 18 months before OT I. A more complete draft of the data should be available about 12 months before OT I.

- b. High-Risk Task TASA. These data consist of a list of tasks identified as high-risk training tasks in accordance with procedures described in TRADOC Pamphlet 351-4. For each task the following information will be provided: (1) estimates of prerequisite skill and knowledge requirements; (2) estimates of mental/physical/attitudinal characteristics; (3) estimates of training device requirements.

REFERENCES

AR 700-127, Integrated Logistic Support
DARCOM Supplement to AR 700-127, Integrated Logistic Support
TRADOC Circular 70-1, Training Device Development
TRADOC Circular 351-4, Job and Task Analysis
TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development
MIL-STD-1388,1, Logistic Support Analysis
MIL-M-63035, Manuals, Technical: Front-End Analysis

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B2

The materiel contractor conducts the TASA as part of the Logistics Support Analysis (LSA) program, performed in accordance with procedures described in AR 700-127 and DARCOM Supplement #1 to AR 700-127. The data sheets prepared during this program provide the primary means for generating and transferring information about the new materiel to the training developer.

The LSA program provides information about all operator and maintenance tasks. However, during OT I, the emphasis is on high-risk training tasks. Therefore, after the LSA program has provided an inventory of tasks, this inventory should be used to identify tasks that pose special training problems. The procedures for accomplishing this are described in TRADOC Circular 351-4.

The TASA information obtained as part of the LSA program does not provide all the information needed to develop a training program. Therefore, those

high-risk tasks selected for training during DT/OT I should be further analyzed in accordance with procedures in Chapter 8, TRADOC Circular 351-4.

One input to Event 32 is the training and personnel information contained in the OAP (Event A10). Attached to the OAP will be the list of high-risk training tasks identified by the training developer. The contractor compares this list in critical tasks with the list he developed and notes discrepancies. An indication of the impact of each discrepancy on the OICTP will be attached to the OAP. For each high-risk task identified, the contractor will provide an estimate of the characteristics (skill and knowledge, physical, etc.) required of the personnel responsible for task performance.

The OAP also contains a description of estimated training device requirements. These must be confirmed by the contractor as part of the AD contract. In addition, the contractor-furnished TASA will identify training device requirements. These requirements will be compared with those described in the OAP. Discrepancies will be noted and the impact of these discrepancies described. Procedures for identifying training device requirements can be found in TRADOC Circular 70-80-1, and are discussed in this handbook under Event B18 (page IV-74).

The task analysis documentation that must be provided for each high-risk training task is described in TRADOC Circular 351-4. This circular also contains flowcharts for assessing required abilities/skills.

Event B2 must be carefully monitored by the training developer since the data generated from this activity have impact on all subsequent training and personnel activities during the LCSMM. As noted in TRADOC Circular 351-4, the development of a task inventory and the selection of tasks for training are the most important activities in the training development procedure. All training plans are based on these activities.

EVENT B3--PERSONNEL TASK/SKILL EVALUATION

OVERVIEW

Purpose

The purpose of Event B3 is to update the training and personnel information contained in the Outline Acquisition Plan. The personnel and training requirements specified in the OAP must be compared with similar estimates now being derived from prototype materiel. Discrepancies must be resolved by conferring with the contractor, after which the OICTP and the Training Support Plan will be revised as required. During Event B3 special emphasis is placed on the initial validation of the list of critical tasks for which training material should be prepared prior to OT I, Event B6. Also, the contractor TASA is used to reassess/revise the critical training issues to be tested during OT I.

Relation to Other LCSMM/IPS Events

This event occurs concurrently with the latter portion of Event B2, Contractor-Furnished TASA. The contractor will be asked to provide a tentative TASA for each operator and maintenance position after the first version of the equipment prototype has been developed. Event B3 occurs during Events 17-20 of the LCSMM.

TSM/AD Responsibilities

The training developer is responsible for Event B3, but it must be performed in cooperation with the materiel developer, the logistics proponent, the Soldier Support Center, and MILPERCEN. If the event proceeds concurrently with Events B1/B2, interaction with the contractor must be coordinated with the PM since the PM has overall responsibility for monitoring the AD contract.

Phasing

Event B3 should begin as soon as possible after Event B2 is under way, but at least shortly after development of the first materiel prototype. The event should be completed 18 months before OT I because the output provides the data base for preparing the training material for OT I.

INPUT DATA/EVENT DATA BASE

- a. TASA Data Provided by the Contractor. These data include Logistic Analysis Reports covering all operator, maintenance, and other support tasks. For high-risk training tasks, additional data as required for the performance of complete front-end analysis for training purposes (see TRADOC Pamphlet 351-4) will be included. A final draft of the TASA data should be supplied about 18 months before OT I. When DT/OT I involves competing contractors, TASA data may not be available until just before DT I. In such cases the contractor will be responsible for providing the complete training package for OT I. TASA data are specified as a deliverable in an AD Prototype contract.
- b. Personnel Requirements/OICTP/Critical Issues Information. This information is contained in or attached to the OAP. See Event A10 (page III-206) for a description of the contents of an OAP.

OUTPUTS AND END PRODUCTS

The major outputs of Event B3 are (a) a revised list of high-risk tasks, (b) revised TASA and other data for operator and for maintenance tasks, and (c) a revised list of personnel and training requirements. As shown in the Phase II chart, the products of Event B3 provide all or part of the data base for all subsequent events related to personnel/training that occur during the Validation Phase. In particular, the data outputs are used to update personnel training factors criteria (B5), to revise the Individual and Collective Training Plan (B12), and to update the personnel and training data (B14) used to prepare the Tentative Qualitative and Quantitative Personnel Requirements Information (B15). The products of Event B3 also are used to revise the OAP, Section V and VI. (See DARCOM Supplement 1 to AR 700-127). Event B3 outputs should be available at least 10 months before OT I.

REFERENCES

AR Regulation 700-127, Integrated Logistic Support

TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training

TRADOC Regulation 351-4, Job and Task Analysis

DARCOM Supplement #1 to AR 700-127, Integrated Logistic Support

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

TRADOC Pamphlet 351-4, Job and Task Analysis Handbook

DARCOM-TRADOC Handbook, Technical Documentation and Training Acquisition

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B3

To the extent possible, this task is performed as part of Event B2. As the contractor prepares TASA data, the training developer periodically reviews the data generated to date. This schedule may not be feasible when DT/OT I involves competition between two contractors, since they may not wish to release any TASA information until time to train soldiers for conduct of OT I.

The first portion of Event B3 entails reviewing the contractor's TASA data for completeness. The training developer will ascertain that all obvious operator and maintenance tasks relative to each materiel subsystem have been covered. He can do this by reviewing, with the materiel developer, the completeness of the data in the Logistic Support Analysis (LSA).

As a second step, the training developer will review the list of high-risk training tasks identified by the contractor in accordance with procedures outlined in TRADOC Pamphlet 351-4. Documentation supplied by the contractor with each high-risk task must support its selection in that category. Discrepancies

between the high-risk task lists developed by the contractor and the lists developed by the training developer in combination with the combat developer will be resolved in consultation with the contractor. This process can be expedited by requiring the contractor to identify such discrepancies and the probable reasons for them.

For each high-risk task the contractor is required to provide additional information as specified in Chapter 8, TRADOC Pamphlet 351-4. These data include skill and knowledge prerequisites, special physical and attitudinal characteristics, unusual working/environmental conditions, training device requirements, training standards, and so on. The training developer verifies that these data have been provided and, if they have not, determines the reason(s) for their absence. In some instances, portions of the materiel will not have been designed by the time TASA data are needed, so the contractor may have to estimate data for certain tasks.

After verifying the TASA data, the training developer uses them to update the training and personnel estimates in the OAP. The general procedures for this step have been described under Events A4 (pages III-60 through III-65) and A7 (pages III-101 through III-___) and are also contained in TRADOC Regulation 350-2 and TRADOC Circular 351-8.

The training portion of the OAP contains a description of the test issues to assess during OI I. These test issues must be revised as appropriate to reflect any revisions in training and personnel requirements.

The TSM/AO and training proponent will examine the impact of any revisions in training or personnel requirements and alert the PM if the revised personnel/training requirements seem to exceed constraint levels described in the LOA.

EVENT 84--INPUT FOR DT/OT I

OVERVIEW

Purpose

Two sets of deliverables must be prepared before DT/OT I are conducted: the Test Support Package and the Independent Evaluation Plan. The Test Support Package (TSP) provides the means for training soldiers to conduct an OT; information on the maintenance, POL, and other elements to sustain the OT; and the description of how the system should be deployed during the OT (mission profile, logistical concepts, tactical doctrine, etc.). The Independent Evaluation Plan (IEP) identifies the issues to be answered, the data sources for each issue, and an evaluation scheme. The IEP is further refined by a Test Design Committee for major systems until it becomes a Detailed Test Plan describing how the OT will be conducted/controlled, how the data will be collected, and how they will be analyzed.

The TSP and IEP are developed concurrently although the IEP should be completed a few months before the TSP. In this handbook the IEP will be discussed under Event 85. The following discussion of Event 84 will concentrate on preparing the TSP.

Relation to Other LCSMM/IPS Events

This event is part of Events 19 and 20 of the LCSMM. For larger systems it begins about 18 months before the scheduled time for OT I, starting after the contractor TASA has been prepared. In cases in which TASA data are not available until shortly before OT I, this event must proceed on the basis of personnel, training, and test issues contained in the Outline Acquisition Plan.

TSM/AO Responsibilities

The TSM/AO is responsible for insuring that input from the combat developer/trainer (normally at the schools), the Soldier Support Center, and LOGCEN is included in the Test Support Package. The materiel developer provides two hardware-related packages, a maintenance test support package and a new equipment training test support package.

To furnish TRADOC inputs to DT/OT I, the TSM/AO must coordinate the activities of various agencies (the Soldier Support Center, LOGCEN, the combat developer, and the training developer). Elements of the TSP provided by the combat developer include test packages addressing means of employment, organization, logistical concepts, mission profiles, appropriate test settings, and a threat statement. The training developer provides appropriate portions of the training element.

For OT I the bulk of the training element is provided by the materiel developer and usually consists of training prepared and administered by the contractor. The training developer (TSM/AO and TRADOC school proponent) provides training related to the tactical deployment of the new equipment. Such training may not be required for OT I.

Phasing

Most of the TSP is needed by the system's Special Task Force/Special Study Group (STF/SSG) 6 to 12 months before the test. An outline of the TSP is needed 15 months before OT I, for use by the Test Development Committee during the development of a Detailed Test Plan (DTP).

INPUT DATA/EVENT DATA BASE

- a. Means of Employment. The FMs and related documents relevant to the test system are designated. This is preferable in the form of documentation produced for the test but acceptable in the form of documentation for the replaced system(s) with supplemental notation as to changes required by the new system. This information is developed by the combat developer.
- b. Organization. A trial Table of Organization and Equipment (TOE) for lowest level of unit employing the system (squad, crew, or section) is supplied, plus Tentative TOE (T-TOE) for the next higher echelon unit and lines of coordination and communication through the division level. The TOE is developed by the combat developer in cooperation with the Soldier Support Center.
- c. Training. Plans for instruction are supplied by contractor or military personnel, probably using contractor-provided Program of Instruction (POI) and training aids. This should be part of the package supplied by the contractor as specified in Event B1, AD Prototype Contract (Page IV-4).
- d. Logistical Concepts. Relevant support documents are designated for operator servicing and organizational support. This is preferable in the form of documentation prepared for the test, but acceptable in the form of documentation for the replaced system(s) with notation as to changes required by the new system. These concepts are developed by the LOGCEN and the materiel developer and supplied to the combat developer.
- e. Threat. A statement of potential targets, countermeasures, and opposing weapons at the single system one-on-one level is prepared. The statement should be based on DA-approved threat as it pertains to the tested system. The threat statement is prepared by the combat developer.
- f. Mission Profiles. A set of probable operational mission profiles is prepared, including attack, defense, exploitation, retrograde, and expected variations of each, or a list of probable types of events for a unit with a tested system, with estimate of frequency and duration of each type mission in operation. Mission Profiles are developed by the combat developer.
- g. Test Setting. The appropriate geographic area and generalized plausible friendly and aggressor situation is designated, probably in the form of a standard TRADOC scenario. This information is prepared by the combat developer.

OUTPUTS AND END PRODUCTS

The Test Support Package is structured to insure that all tasks associated with hardware are tested and/or evaluated. These include operations, maintenance, and support tasks that are required to make the system effective. The TSP is delivered to the test organization to be used in preparing the test design plan. It must be completed 6 months before OT I.

REFERENCES

AR 70-10, Test and Evaluation During Development and Acquisition of Materiel

AR 71-3, User Testing (Force Development User Testing)

AR 310-31, The TOE System

TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training

TRADOC Circular 351-8, Individual and Collective Training Plan for Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

OTEA, Operation Test and Evaluation Handbook

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

Mitre Corporation, A Guide for TRADOC Systems Managers

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B4

The TSM/AO coordinates the input of various agencies (the Soldier Support Center, LOGCEN, combat developers, and training developers) required for production of the Test Support Plan for OT I. Since DT I is conducted exclusively by the materiel developer, and is materiel oriented, TRADOC does not normally provide input for DT I even when DT I is combined with OT I.

The elements provided by the combat developer are described briefly below.

- a. Means of Employment. Statement of doctrine, tactics, techniques, logistical concepts, and means of employment for the tested system. The doctrine package should include enough detail to permit realistic system employment at each test level (e.g. tactical unit SOP, crew drill, combat exercise, and operator manuals). It is used to guide the development of test events in test design planning and to govern user troop actions during the test.
- b. Organization. Statement of MOSs, basis of issue, unit structures, and line of command or coordination for units employing tested systems. When new MOSs are included, a description of specific duties of individuals in each new MOS is required. It is used to structure the player units in test planning.
- c. Logistical Concepts. Statements of applicable supply, transportation, and maintenance concepts, and including procedures compatible with the maintenance support packages provided by the materiel developer. They are used to govern support actions during the test and to plan data collection in the areas of reliability, availability, maintainability, and logistical support.
- d. Threat. Statement of potential threat in Initial Operational Capability (IOC) time frame relating to the tested system, including capabilities, typical means of operating, and known methods of defeating the system. It is used to guide development of test conditions of test design planning and to govern aggressor elements in the test.
- e. Mission Profiles. Statement of types and frequency of events in the combat missions involving the tested system. This takes the form of either a set of alternate mission profiles or a typical profile plus statistical distribution of frequency of events. It also includes estimated or actual duration times of events and the times between events. It is used to guide test design planning of conditions and events.
- f. Test Setting. Statement of plausible situation to show interaction between threat, friendly actions, and environment involving tested system. It is in the form of a standard TRADOC scenario to provide the situation in which the specific test events are set. It must be compatible with Item "d", Threat. It is used to guide test design in the test setting and environment.

The training developer is responsible for providing certain elements of the Test Support Package. He identifies the training contents needed for this package, in cooperation with the materiel developer. During the preparation for OT I, the contractor ordinarily supplies the training, using contractor-provided

training material and aids, training devices, and Program of Instruction. The actual portions of the training material to be supplied by the materiel and training developers will be determined on a case by case basis as described in TRADOC Regulation 350-2.

The materiel and training developers will have joint sign-off authority on training material. In particular, the POI used during DT/OT I must be approved by the training developer.

The important training products that should be developed prior to OT I are identified in Appendix B, TRADOC Circular 351-8. They include:

- a. Synoptic outline for technical manuals (TMs) and preliminary documentation and storyboard training materials for high-risk training tasks.
- b. Draft Training Extension Course (TEC) material.
- c. Brassboard configuration of training device(s) for high-risk training tasks.
- d. Draft collective training material for high-risk tasks.

During OT I two major training issues will be examined: (a) Does the training material effectively teach what it was designed to teach, and (b) can persons trained to standards proficiently operate/maintain the equipment? The answer to the second question depends in large measure on the adequacy of the task inventory and the list of high-risk training tasks selected during Event B3. The answer to the training effectiveness question depends on the care with which the training material was developed and validated. Therefore, the training material prepared for OT I must be developed and validated in accordance with procedures described in ISD documents (TRADOC Pamphlet 350-30).

The training materials and devices to be used to train soldiers for OT I must undergo their own validation. Preferably this is done some months before OT I so that, if needed, the material can be modified by the time the OT occurs. In practice, the training support system is often both tested and validated when first used to train operators for OT I. This is a risky practice because defects in the training material may have a negative impact on other portions of the OT.

Prior to OT I the TSII/AO and the training developer have the joint responsibility, with the materiel developer, of monitoring the development and test/validation of training material and devices.

EVENT 85--PERSONNEL/TRAINING FACTORS CRITERIA

OVERVIEW

Purpose

Developmental and operational tests (Event 86) must be conducted in accordance with a detailed test plan. This plan is developed by an independent test agency, usually the Operational Test and Evaluation Agency (OTEA). The training developer prepares the training inputs to the test plan. After an Independent Evaluation Plan (IEP) is developed and approved, successively more detailed test plans are developed until the final Detailed Test Plan (DTP) is prepared. The DTP describes the issues to be tested, how the test will be conducted and controlled, and how the test data will be summarized and analyzed. During development of the DTP, criteria must be established for evaluating the effectiveness of training material and devices and for assessing the degree to which personnel factors and requirements have been adequately identified.

Relation to Other LCSMM/IPS Events

During this event specifications are developed for the conduct and test of the training portion of OT I. Also, the measurement and data collection techniques developed during Event 85 provide the basis for the conclusions reached in preparing an Independent Evaluation Report, during Event 87.

TSM/AO Responsibilities

For major systems and designated non-major systems, Event 85 is the responsibility of the Operational Test and Evaluation Agency. For non-major systems, an element of TRADOC may be designated as the independent tester. When OTEA has the responsibility, the training developer will be represented on the Special Study Group that prepares the IEP and on the Test Development Committee, OTEA,

that prepares the DTP. The TSM/AO is responsible for obtaining test issues from the training and combat developers and from other TRADOC agencies as appropriate.

Phasing

Preparation of the IEP begins about 18 months before the scheduled OT/DT I.

INPUT DATA/EVENT DATA BASE

- a. Training and Personnel Test Issues as stated in the OAP. Sections IV and V of the Outline Acquisition Plan (OAP) (the output from Event A10 contains a description of these issues.
- b. Personnel Task/Skill Evaluation. This consists of updated information on training/personnel requirements and critical issues. The information is developed during Event B3, Personnel Task/Skill Evaluation.

OUTPUTS AND END PRODUCTS

An Independent Evaluation Plan that outlines the approach to system evaluation, and a Detailed Test Plan that describes the test issues, the conduct/control of the test, the data to be collected, and the procedures for processing the data. These documents supply the data used by the operational tester to produce the Independent Evaluation Reports, which provide conclusions regarding the effectiveness of the materiel and the logistics support package. The IEP will be available 6 months before DT I.

REFERENCES

- TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training
- TRADOC Regulation 700-1, Integrated Logistic Support
- TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures
- TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development
- TRADOC Pamphlet 351-4, Job and Task Analysis Handbook
- OTEA, Operational Test and Evaluation Handbook

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B5

The IEP states the critical issues to be answered, the sources of data for each issue, and the scheme for data evaluation. The training developer determines the training issues. The TSII/AO, with the assistance of the Soldier Support Center and MILPERCEN, coordinates the personnel issues. At a minimum, these training issues will be assessed during OT I:

- a. Are the training materials/devices developed for OT I capable of training soldiers to the desired standards?
- b. Are soldiers trained to specified standards capable of performing on the equipment to required proficiency levels?
- c. Other issues as developed by CD and TD.

The Outline Acquisition Plan (A10) and the TASA data obtained from the contractor (B3) will either identify certain critical issues (e.g., reading level required for maintenance personnel for use of the technical manuals) or indicate that current selection standards for operator and maintenance personnel are expected to be adequate to provide suitable personnel to maintain the new system. In either case, a critical personnel test issue concerns whether personnel meeting the stated estimated personnel requirements for the new system can or cannot learn to perform proficiently on the system. The personnel issue may be stated as "What special aptitudes are required of operators of system X?"

After the IEP is approved the process of preparing a detailed test plan begins. Usually the persons who prepared the IEP form the nucleus of a Test Design Committee. This committee first prepares an Outline Test Plan (OTP). After the OTP is approved it is expanded into a Test Design Plan (TDP), which is submitted for approval to the DA Test Schedule and Review Committee. Once the

TDP is approved, it is further expanded into a Detailed Test Plan (DTP), which describes the test scenario, the data to be collected, the test control procedures, and the data summary and analysis procedures.

The entire test planning process involves the successive refinement of a general test plan. The approach is basically as follows:

- a. State the training issue to be examined. The issue might be: Can soldiers be trained to required standards using material prepared in accordance with the individual training plan for critical tasks?
- b. Subdivide the general training issue into smaller, more definitive training issues, such as: (1) Is the classroom training effective? (2) Is the training device effective?
- c. Further subdivide the training issues until statements of specific training issues for which data can be collected can be identified. Such issues might be: (1) Can soldiers be trained to standards on all operator tasks? (2) Does the POI cover all critical maintenance tasks? (3) Does SPAS material effectively support all tasks not covered during classroom instruction?
- d. For each detailed training issue, identify the criterion for acceptable performance. For operator tasks it might be that 90% of the trainees can meet training standards on 90% of the operator tasks after going through the contractor training program.
- e. For each training issue, identify the data that are required. In most cases these will be knowledge or performance test data or student/instructor opinions obtained from interviews or questionnaires.
- f. For each major training issue, describe how data related to training subissues will be summarized and combined to obtain the second-order data necessary to evaluate major issues.
- g. As appropriate, prescribe:
 - (1) Test conditions
 - (2) Number of trials required
 - (3) Comparisons to be made
 - (4) Statistical, numerical, and non-numerical methodology

- h. Describe the estimated characteristics of the target population. Within each target population group, the persons selected for operators and support personnel during OT I should be fairly heterogeneous so that comparisons can be made between background data and test results.

EVENT B6--DEVELOPMENT TESTING I (DT I) AND OPERATIONAL TESTING I (OT I)

OVERVIEW

Purpose

Developmental Test I (DT I) is conducted to demonstrate that technical risks have been properly identified and that solutions are feasible. Components, subsystems, brassboard configurations, or advanced development prototypes are examined to evaluate the potential application of technology and related design approaches prior to entry into full scale development.

Operational Test I (OT I) is a test of brassboard configurations, experimental prototypes, or advanced development prototypes to provide an indication of military utility and worth to the user. OT I also provides basic data necessary for a decision to enter full-scale development. Testing must refine critical issues and identify areas that should be addressed in future testing. In general, OT I provides the data to determine:

- a. Estimates of the potential of the new material system in relation to existing capabilities.
- b. Estimates of the relative merits of available competing prototypes or systems from the aspect of military utility.
- c. Estimates of the adequacy of the concepts for employment; supportability; trainability; organizational, doctrinal, and tactical requirements; and related critical issues.
- d. An early identification of operational problems in a field environment.
- e. Critical issues for examination in OT II.

Relation to Other LCSMM/IPS Events

Event B6 encompasses Events 21 (Development Test I) and 22 (Operational Test I) of the LCSMM. It is the direct result of decisions made at the IPR/ASARC I/DSARC I. The data and results of this event provide input to and guide the development of all subsequent events in the Demonstration and Validation Phase.

TSM/AO Responsibilities

Since the DT I and OT I are normally conducted by independent test and evaluation organizations, the TSM/AO has no direct responsibility. He does, however, provide representatives to observe the testing.

Phasing

The Special Task Force or Special Study Group (Event 3 of the LCSMM) tentatively schedules the DT I/OT I. For minor systems the PM schedules DT/OT I.

INPUT DATA/EVENT DATA BASE

Detailed Test Plan (DTP) (from Event B5).

OUTPUT AND END PRODUCTS

The Test Report (TR) is a detailed description of the conditions under which the test was conducted and the findings from the test. Unavoidable departures from the test plan are described and explained. The TR provides the data and the testing condition descriptions needed to prepare an Independent Evaluation Report (Event B7). The TR will be available 1 month after OT I is completed.

REFERENCES

AR 70-10, Test and Evaluation During Development and Acquisition of Materiel

AR 71-3, User Testing (Force Development User Testing)

TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training

TRADOC Regulation 700-1, Integrated Logistic Support

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

TRADOC Pamphlet 351-4, Job and Task Analysis Handbook

OTEA, Operational and Test Evaluation Handbook

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

Mitre Corporation, A Guide for TRADOC System Managers

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B6

Development Test I is the responsibility of the materiel developer. Normally, U.S. Army Test and Evaluation Command (TECOM), an agency of DARCOM, conducts the DT at one of TECOM's proving grounds. The involvement of the TSM/AO in DT I is minimal. The TSM/AO will normally be asked to send a representative to act as an observer, and the TSM/AO receives a copy of the test report.

The DT and the OT are separately conducted, so the results of one test should not influence the results of the other. OT I is normally held jointly with DT I because of limited resources for the test or when environmental or operational conditions preclude the desired test realism. When this occurs, two separate test reports (one for DT issues and one for OT issues) are still prepared and are treated as if two separate tests had taken place.

The Operational Test and Evaluation Agency conducts the operational testing for all major and selected non-major items. OT I occurs early in the materiel acquisition process, when only a limited number of brassboard configurations, experimental prototypes, or advanced development prototypes and incomplete test support packages are available for testing. The scope of OT I is tailored toward searching for potential problems that could significantly affect the military utility and the operational effectiveness of the system. The following characteristics are of concern during OT I:

- a. Size and Training of the OT I Player Unit. An OT I is usually conducted with one prototype of the new system. Training is usually limited to individuals and crews. Data collection on training includes qualification tests at the termination of training (oral, written, and tactical exercises), plus performance data obtained during other portions of the test.
- b. Focus of OT I Data. An OT I is generally limited and may not completely address all data areas. A limited test focuses on the primary system function (e.g., firepower for a weapon, mobility for a transport system) with individuals or single crews. The scope may be limited to obtaining sufficient data to permit evaluation of the system's military utility, compatibility with other systems, and identification of user problems when operating in the field.
- c. Type of OT I Events. A small test does not allow large operations over extended time periods. An OT I focuses on a system operating in the field in accordance with an abbreviated mission profile. Each trial may require a few hours or a day with individuals, single crews, or a section.
- d. Type of Comparison in OT I. The comparison is usually limited to an operator or crew using a single prototype of the new system versus the same crew using a single item of the old system. A second type of comparison is between competing equipments. At the time of OT I, the DARCOM Source Selection Board often is still considering competing prototypes. While deciding between equipments is not the purpose of the OT, it must completely test all competing equipments so that the ASARC II or IPR has an independent operational evaluation of all candidates. This means that as a by-product of operational testing, OT I must provide comparative data on competing candidate systems for use by the Source Selection Board.
- e. OT I Treatment of Reliability, Availability, and Maintainability (RAM) Data. RAM data are recorded and reported from OT I and OT I subtests. Maintainability at the individual operator level can usually be addressed in OT I. Availability and reliability can be roughly inferred from failure data and individual maintainability.

EVENT B7--EVALUATION OF RESULTS OF OT/DT I

OVERVIEW

Purpose

Following completion of OT/DT I, an Independent Evaluation Report (IER) is prepared, presenting a position on the operational effectiveness of the materiel and of the logistics support elements, independent of the views of the materiel developer and the user. Conclusions are drawn concerning each major test issue. Shortcomings and deficiencies of the materiel and logistics support elements are noted. The need for further exploration is also noted. Reasons are provided in support of any contention that deficiencies can be corrected without further testing.

Relation to Other LCSMM/IPS Events

The IER, along with an accompanying COEA/CTEA, provides critical inputs to the Acquisition Plan, Event B24; together they provide support for a recommendation to continue or not to continue the material acquisition process. Also, test data and conclusions contained in the IER are used to review personnel and training requirements and to update the OICTP.

TSM/AO Responsibilities

For all major systems and for non-major systems of special interest, the combat developer/trainer reviews the IER covering operational, personnel, and training issues. The operational tester and the materiel developer each prepare separate IERs. For non-major systems, TRADOC Test Boards will be tasked to function as the designated independent tester. When this is the case, CAC is responsible for preparing an IER as the operational tester. The TSM/AO is responsible for conducting these activities.

Phasing

The IER will be prepared within 3 months after completion of the OT.

INPUT DATA/EVENT DATA BASE

OT Test Report (TR) (from Event B6). The Test Report describes the test conditions and the findings resulting from the test, for each subtest issue. The report may contain descriptive data that have been subjected to statistical analysis. The Test Report is prepared by the test director. For major systems this is OTEA; for non-major systems test findings are reported by the designated OT/OT tester. The report will be available about 1 month after the OT.

OUTPUTS AND END PRODUCTS

The Independent Evaluation Report (IER) contains conclusions about each of the major issues examined during an OT, including operation, training, and personnel test issues. The TRADOC IER is used to revise training requirements and plans as well as estimates of personnel requirements. The IER also provides inputs used to prepare a tentative QQPRI (B15) and to conduct a COEA/CTEA study (B24). It also provides some of the data used when preparing human performance standards (B21) and training criteria (B22). The TRADOC IER should be completed about 2 months after the OT is finished.

REFERENCES

TRADOC Regulation 350-2, Training: Development, Implementation and Evaluation of Individual Training

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

EXAMPLES AND ILLUSTRATIONS

Figure IV-2 shows the format for an IER prepared by the operational tester.

TITLE PAGE

EXECUTIVE SUMMARY

1. Purpose and scope
2. Test item
3. Adequacy of testing
4. Operational test limitations
5. Operational issues
6. Major findings
7. Other findings
8. Conclusions

SECTION 1.0 GENERAL

Authority
Purpose and scope
Data sources
Background
Adequacy of operational testing
Threat

SECTION 2.0 OPERATIONAL TEST ANALYSIS

Operational issue analysis
Item tested
Operational test (OT, I, II or III) description
Evaluation of operational issues

SECTION 3.0 PERFORMANCE ISSUES

SECTION 4.0 LOGISTIC SUPPORT ISSUES

SECTION 5.0 RELIABILITY, AVAILABILITY AND MAINTAINABILITY

SECTION 6.0 SURVIVABILITY ISSUES

SECTION 7.0 TRAINING ISSUES

SECTION 8.0 ORGANIZATION ISSUES

SECTION 9.0 CONCLUSIONS

APPENDIX A FUTURE TESTING REQUIREMENTS

BIBLIOGRAPHY

ABBREVIATIONS AND ACRONYMS

OPERATIONAL ISSUE INDEX

Figure IV-2. Typical Independent Evaluation Report Format

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B7

Preparation of an Independent Evaluation Report (IER) involves four major steps: application of findings to the issues, synthesis of subtest conclusions into conclusions about major test issues, report assembly, and coordination and concurrence.

As noted in the discussion of Event B4, the OT Detailed Test Plan for training and for personnel will address at least three critical issues; (a) Can soldiers be trained to specified standards using the draft training material developed and training schedules prepared for OT 1? (b) Can soldiers trained to these standards perform proficiently on the materiel? (c) What are the background characteristics of those soldiers who could and could not be successfully trained to operate/maintain the equipment?

The detailed Test Plan divided the major test issues into subissues. As a first step in preparing the IER, the IER team must assemble data pertaining to each subissue. The team must then assess the reliability and validity of each data element, establish verbal or numerical weights for each data element if that is needed, and summarize data elements bearing on the same subtest issue into one to two findings. When the test findings for the individual subtest issues are ambiguous or conflicting, data outside the OT should be considered. Data from other studies or from personal experience may be cited to clarify test findings.

The OT data were obtained under specific test conditions. It may not have been possible to follow the Detailed Test Plan or, after the test plan was developed, it might have been decided that additional test conditions should have been included in the plan. In these cases, the IER team must submit the test

data to a risk analysis. In this analysis, judgments are made about the probability of similar data being collected if the test were rerun or if the test conditions had been different. Also, this risk analysis will note any deficiencies uncovered by the OT and discuss the probability of developing an acceptable technical fix for these deficiencies.

For each subtest issue, the IER team will prepare a conclusion--an evaluative statement of the degree to which some portion of the materiel or support system functioned acceptably. For example, such a conclusion might state that "the POI for maintenance personnel did not cover all critical direct support maintenance tasks." In support of each conclusion, the IER team will discuss how data were weighted and combined, the reasons for discarding data (if that happened), how conflicts among data were resolved, and so on.

After conclusions are developed about subtest issues, the next step in preparing the IER is to synthesize the subtest conclusions into broader conclusions about each major test issue. The procedures are similar to those for subtests; that is, the team assesses subtest issue conclusions for reliability and validity, and assigns numerical or verbal weights to each subtest conclusion. If the subtest conclusions conflict, the use of non-OT data to resolve the conflict is considered. The team estimates the risk of using any particular subtest conclusions for form conclusions about a major test issue; they then combine subtest conclusions to form one or two concluding statements about each major test issue. Such a conclusion might be "system operators can be effectively trained using only low fidelity mock-ups followed by a short training session on actual equipment."

As a final step in summarizing the OT data and the IER conclusions, the IER team will prepare a statement encompassing all the training and personnel issues. This statement will present the relationship among the major test issues, differences in importance among test issues, and differences in the strength of supporting evidence. Potential trade-offs between excess capability in one area and shortfalls in other areas must be discussed. If plans have been made to collect additional data on personnel or training issues, the team considers the probable impacts of these data.

Finally, the IER team prepares a statement of the overall operational effectiveness of the training system and of personnel selection criteria after taking all considerations into account. This statement is reduced to a paragraph that is the clearest and briefest statement possible.

After the OT position has been completely developed, an executive summary suitable for general officer review must be prepared. The IER is then assembled for coordination and concurrence within TRADOC.

EVENT 88--DEVELOPMENT OF ISSUES FOR FURTHER TEST

OVERVIEW

Purpose

This event identifies personnel and training issues that should be examined during OT II or in studies prior to OT II.

Relation to Other LCSMM/IPS Events

The issues identified during Event 88 should be incorporated into the Acquisition Plan (B24). When the issues are particularly important, they could become the topic of special personnel or training studies later in the Validation Phase.

TSM/AO Responsibilities

The TSM/AO is responsible for coordinating the development of further test issues. The issues themselves are identified by the combat developer with assistance from the training developer.

Phasing

Event 88 will begin as soon as the Independent Evaluation Report is completed and must be finished within 1 month.

INPUT DATA/EVENT DATA BASE

- a. DT/OT I Test Report (from Event 86). A report describing the test conditions and the findings of DT/OT I.
- b. Independent Evaluation Report prepared by TRADOC (from Event 87). A report containing conclusions about each of the issues examined during OT I.

OUTPUTS AND END PRODUCTS

A list of training and personnel issues that should undergo further tests either during OT II or as part of personnel/training studies before OT II. This

list of issues is used to prepare training portions of the Acquisition Plan (B24) and training/personnel inputs to the OT II test plan. The issues must be identified within 2 months after the IER is completed.

REFERENCES

TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B8

It is quite probable that certain test issues related to personnel and training could not be assessed adequately during OT I. Prototype training devices might not be available for testing. Soldiers made available for training might have different background characteristics than those predicted for the soldiers who will eventually operate or maintain the system. The test might utilize a single piece of equipment, precluding evaluation of test issues related to crew training.

One of the purposes of OT is to identify deficiencies in the training and personnel support package; means for eliminating these deficiencies should be tested during OT II. Both DT and OT I might result in recommendations for changes in the materiel; each change must be examined in terms of its impact on training and personnel requirements. Also as a result of OT I, changes might be made in the operational concept of the materiel; the impact of these changes on training/personnel requirements may warrant assessment during OT II.

To accomplish Event B8:

- a. Prepare a list of training deficiencies identified during OT I. Determine how each deficiency should be corrected and then decide whether these corrective procedures need to be subjected to test during OT II.

- b. Prepare a list of training issues that were not tested during OT I. Select those issues critical to mission success, and identify them as issues to be tested during OT II.
- c. Review the Test Report prepared by the materiel developer and determine whether major materiel changes have been recommended. If so, for each change, determine whether the proposed change will result in a different allocation of functions and tasks to equipment operators and support personnel. If this is the case, estimate the impact of the changes on personnel/training requirements. Identify as a test issue impact areas that seem critical to mission accomplishment, those that seem to involve high-risk training tasks, and those for which the impact on training/personnel requirements is not known.

EVENT B9--VERIFICATION/REVISION OF TASK LIST

OVERVIEW

Purpose

Training provided before or during OT I is based on a list of critical tasks first developed during Events A3 and A6 and updated on the basis of TASA data provided by the contractor. This task inventory must be verified, and revised as appropriate, and a final selection made on the tasks to be included in training.

Relation to Other LCSMM/IPS Events

Event B9 is based on the OT I findings and on the recommendations contained in the IER. The output of Event B9 is used to update the OICTP (B12) to ICTP and to provide a data base for use during preparation of the tentative QQPRI (B14 and B15). Event B9 should be done concurrently with Event B10, Verification of Personnel Criteria, and Event B11, Verification of Training Requirements.

TSM/AO Responsibilities

The training proponent verifies and revises the task listings. The TSM/AO coordinates this activity.

Phasing

Event B9 begins as soon as the IER is completed and must be finished within 2 months. As noted previously, Events B9, B10, and B11 should be done concurrently.

INPUT DATA/EVENT DATA BASE

- a. DT/OT I Test Report (from Event B6).
- b. Independent Evaluation Report (from Event B7).

c. LSA Reports and Records (from Event B2).

d. High-Risk Task TASA (from Event B3).

OUTPUTS AND END PRODUCTS

A revised inventory of tasks is prepared for each operator and maintenance position. Those high-risk tasks selected for training will be identified and brief documentation provided to explain the reason(s) for their selection. The inventory is used to prepare the Individual and Collective Training Plan and as an input for the preparation of a tentative QQPRI. It will be available within two months after OT IER is completed.

REFERENCES

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

TRADOC Pamphlet 351-4, Job and Task Analysis Handbook

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B9

Events B2 and B3 resulted in updated lists of critical tasks. Methods for training personnel to perform these tasks are developed (usually by the contractor) and assessed during OT I. It is quite likely that OT I will indicate that certain critical tasks were not initially identified, while other tasks in the first list actually were not critical.

Before OT I, decisions are made on allocation of tasks between operator and support personnel (Event A6). OT I findings may demonstrate that certain tasks should be reallocated to different operator/maintenance personnel.

As already noted, certain changes in materiel design are recommended as the results of OT I. Each of these changes must be examined to determine the impact it will have on the task performance requirements for operator and maintenance personnel.

The procedures for accomplishing Event B9 are similar to those described for Event A6, Task Listing (page III-90). They involve the following steps:

- a. Review task inventory originally developed for each operator and support position. Determine whether the approved IER recommends changes in task allocation, performance requirements, and so on for any of these tasks.
 - (1) Determine whether IER has identified an additional list of tasks that should be considered as high-risk. In most instances these will be tasks which were originally judged to be low-risk but which, in preparation for the OT, were found to be difficult to teach.
 - (2) Based on updated information about the tasks performed by each operator and maintenance position, review the task inventories and the reasons for selecting the tasks for training. Using task selection procedures/criteria in TRADOC Pamphlet 351-4, make appropriate revisions to the list selected for training.
- b. Identify changes to be made in materiel and in operational concepts. For each of these changes,
 - (1) Identify those job positions that are affected by the proposed changes.
 - (2) Determine whether changes in duty/task assignments will result from these changes.
 - (3) Develop new or modified task inventories to reflect the impact of the intended changes.
 - (4) Perform a rough TASA for new tasks added to the inventory. Identify those that are mission-critical, high-risk training tasks, and add them to the list of tasks already selected for training.
- c. Identify additions or deletions to the list of collective and tactical tasks as developed by the TRADOC combat developer proponent.
- d. Prepare an integrated list of individual, collective, and tactical tasks for each duty position so that both the materiel and the training developers will have a common task list.

EVENT B10--VERIFICATION OF PERSONNEL CRITERIA

OVERVIEW

Purpose

During Event B5 personnel selection criteria were identified for operator and maintenance positions. The purpose of Event B10 is to verify these criteria and to amend them if necessary.

Relation to Other LCSMM/IPS Events

This event is performed concurrently with Events B9 and B11 and is carried out by the same persons.

TSM/AO Responsibilities

The TSM/AO is responsible for coordinating the activities of proponent school personnel as they accomplish this event.

Phasing

Concurrent with Event B9 and Event B11.

INPUT DATA/EVENT DATA BASE

- a. DT/OT I Test Report (from Event B6)
- b. Independent Evaluation Report (from Event B7).

OUTPUTS AND END PRODUCTS

An updated set of personnel selection criteria for each duty position associated with the new system. These criteria provide input for preparing the tentative QQPRI and updating the OICTP. Event B10 outputs should be available within 2 months after the TRADOC IER Report is completed.

REFERENCES

- AR 70-80-1, Training Device Development
- AR 71-5, Introduction of New or Modified Systems/Equipment (to be replaced by AR 350-XXX)

TRADOC Circular 350-3, Individual/Collective Training and Development
Glossary (TBP)

TRADOC Circular 351-3, Individual Training Plan (TBP)

TRADOC Circular 351-4, Job and Task Analysis (TBP)

TRADOC Circular 351-5, SQT Policy and Procedures

TRADOC Circular 351-8, Individual and Collective Training Plans for
Developing Systems: Policies and Procedures

TRADOC Circular 351-XXX, Collective Training Plan (TBP)

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System
Development

ARI TR-78-A7, TSII Guide to Training Development and Acquisition of Major
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Paragraphs for Requirements Documents and Operational Test Training
Issues

Braby, R., et al., A Technique for Choosing Cost-Effective Instructional
Delivery Systems

DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B10

Beginning in Event A4 (Personnel Requirements) and continuing through Event B2 (Contractor-Furnished TASA), Event B3 (Personnel Task/Skill Evaluation), and Event B5 (Personnel/Training Factors Criteria), estimates are made of the personnel requirements that must be met by operator and support personnel for the new equipment. For those high-risk tasks covered during training for OT I, estimates were made of the mental, physical, skill/knowledge, and attitudinal prerequisites. During OT I data were collected on the personal characteristics of soldiers assigned as OT I test players. Training records for these persons also are maintained.

The OT test report and the IER will contain various types of information for OT I participants, such as classification test scores, age, time in service, formal education, military schooling, and expressed job interests. The test report and IER also will contain the training records for OT I operators and maintenance personnel, including the operators/mechanics who failed to complete various aspects of their training for OT I and the observed reasons for such failures.

During OT I, training and test information is developed from key personnel (instructors, senior NCOs, and officers) on the attributes that seem to distinguish highly proficient from less proficient personnel. These and any other relevant data are used to verify and/or revise the personnel selection criteria established for OT I. A study of the reasons why certain persons failed portions of the OT training program or passed them with exceptional ease will be especially emphasized. When possible, failures are attributed either to deficiencies in the training material or approach or to personnel factors.

Personnel criteria established for OT I are examined to determine whether those persons who just met or did not quite meet personnel selection criteria still learned to perform proficiently. There is a tendency to establish personnel criteria that are too high or too restrictive. Training data and the comments of key personnel will be used to judge whether personnel selection criteria might be lowered.

EVENT B11--VERIFICATION OF TRAINING REQUIREMENTS

OVERVIEW

Purpose

This activity is a continuation of Event B9, in which revised lists of tasks were selected for training. In Event B11, training requirements for each task are prepared or updated.

Relation to Other LCSMM/IPS Events

This activity is accomplished concurrently with Events B9 and B10 and will be performed by the same personnel.

TSM/AO Responsibilities

Event B11 is accomplished by the training proponent and is coordinated by the TSM/AO for the system.

Phasing

This event must be completed within 2 months after the IER is finished.

INPUT DATA/EVENT DATA BASE

- a. DT/OT I Test Report (from Event B6)
- b. Independent Evaluation Report (from Event B7)
- c. Revised list of tasks selected for training (from Event B9)

OUTPUTS AND END PRODUCTS

For each duty position an updated list of individual and collective tasks selected for training, along with a statement of the training standards for each task. This information can be combined with the output of Event B9. It is used to update the OICTP, and to provide input for preparation of the tentative QQPRI. The lists should be available within 2 months after the TRADOC IER Report is completed.

REFERENCES

Same as for Event B10, page IV-45.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B11

The Task and Skill Analysis provided by the contractor (B2) furnished a task inventory for each duty position. Certain tasks within each of these inventories were identified as high-risk tasks for which training material was developed. As noted during the discussion of Event B9, the task inventory developed for each job position must be verified and revised in accordance with OT I test results, especially changes in the materiel design and/or system operational concepts.

In preparation for OT I, breadboard and storyboard systems were developed to support high-risk tasks. The effectiveness of this material, including draft TMs, training devices, and SPAS material, was examined during OT I. It can be expected that this examination indicated that certain portions of the draft training material were acceptable while other portions were not. Also, it may be determined that certain training was necessary and/or that training is needed for certain tasks that, before OT I, were judged to be low-risk tasks.

During Event B11 representatives of the training proponent examine each task selected for training during Event B9 and

- a. Update the training standards.
- b. Decide whether Skill Performance Aids (SPAs) or Training Extension Course (TEC) material can substitute for institutional training.

Particular attention is given to the development of training requirements for any new individual, collective, or tactical tasks added to the inventory of tasks selected for training (B9). Procedures for preparing those specifications were discussed under Events A3 (page III-14) and A7 (page III-101), and can be found in TRADOC Pamphlet 350-30.

EVENT B12--UPDATE OF DRAFT ICTP

OVERVIEW

Purpose

During Event B12 the Outline Individual and Collective Training Plan developed during the Concept Phase is updated and refined. The ICTP "identifies the elements of the training subsystem, developed separately, and coordinated and available for testing/validation during OT II. The ICTP provides training developers and staff elements with: (1) a management tool to insure a complete training package is developed; and (2) a reference document for use in preparing and supporting the basic system decision making, programming, and planning processes and sequences" (TRADOC Circular 351-8).

Relation to Other LCSMM/IPS Events

The updated draft ICTP provides the information needed to update the training support estimates and to prepare the ICTP (B17), provides inputs to the CTEA, and furnishes much of the training information to be incorporated into the Required Operational Capability (ROC) or Letter Requirement (LR) (B20). Also, the draft ICTP provides implementation schedules for all subsequent training activities in the material acquisition process. Updating procedures are continued in Event B13.

TSM/AO Responsibilities

The proponent school/training developer prepares the updated draft ICTP, obtaining inputs from the materiel developer and from LOGCEN, the Soldier Support Center, and other appropriate agencies. The TSM is responsible for coordinating these activities and for staffing the draft ICTP. Coordinating and staffing requirements are outlined in Figure IV-3 and are described in TRADOC Circular 351-8.

DEMONSTRATION AND VALIDATION PHASE

TRAINING ACTIVITIES	DCSD	DCST	TSM	PROPOONENT SCHOOL	DARCOM	CAC	ADMINCEH	ADMINCEN SCHOOL	LOGCEN	LOGCEN SCHOOL	ATSC
Outline Test Plan	R/C/A		R	P/I*	I	R	R	R/I	R/I	I	R
Independent Evaluation Plan	R/C/A		R	P/I*		R	R	R/I	R	I	R/I
TQPR	R/C/A	R	R	I	P	R	R	R/I	R/I/IC	I	R
TBOIP	R/C/A	R	R	P	I	R	R	R/I	R/I/IC	I	R
Draft SPA Products	R		R	I/A	P/C				R/I	I	R
NETP/IKP	R/I		R	I	P		R	R/I	R/I	I	R/I/C/A
ICTP Update(s)	R/A	R	R	P	I		R	R/I	R	I	R/C
COEA & CTEA Update	R/C/A	R	R	P	I	R	R	R/I	R/I	I	R
ROC/LR	R/C/A		R	P	I	R	R	R/I	R/IC	I	R
TDR/TDLR	R/C/A		R	P	J	R	R	R/I	R/I	I	R/I/C
AP	R/C/A		R	I	P	R	R	R/I	R/I	I	R

*OTEA FOR MAJOR SYSTEMS

- P = Primary Proponency
- R = Review Within Mission Area
- I = Input
- C = Coordinate as Matter of Mission/Function
- IC = Internal Coordination
- A = TRADOC Approval Authority

Figure IV-3. TSM Coordinating and Staffing Requirements

Phasing

The ICTP must be submitted along with the ROC/LR. It must be prepared in draft form at least 4 to 6 months before this submission, so that its contents can be used by the materiel developer in preparing the tentative QCPRI (B15) and the tentative Basis of Issue Plan (B16).

INPUT DATA/EVENT DATA BASE

- a. Independent Evaluation Report (from Event B7).
- b. Verified/revised list of tasks selected for training (from Event B9).
- c. Verified personnel selection criteria (from Event B10).
- d. Verified/revised training requirements (from Event B11).

OUTPUTS AND END PRODUCTS

This document describes the plans for developing all elements of the individual and collective training packages needed in support of the new equipment. The draft ICTP provides inputs to all subsequent training activities; it provides training information for incorporation into the tentative QCPRI (B15), the ROC/LR (B20), and the Acquisition Plan (B24). The draft ICTP must be completed prior to preparation of the tentative QCPRI (B15).

REFERENCES

Same as for Event B10, page IV-45.

EXAMPLES AND ILLUSTRATIONS

The discussion of Event A7, Outline Individual and Collective Training Plan, contains illustrations of all the paragraphs and subparagraphs of an OICTP/ICTP (page III-101).

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B12

Policies and procedures for preparing an OICTP/ICTP are discussed in TRADOC Regulation 350-2 and TRADOC Circulars 351-8 and 351-XXX. Detailed procedures for preparing an OICTP are described under Event A7 (page III-101).

As the result of Event A7, plans were prepared for providing training for each officer and enlisted duty position associated with the operation or support of the new materiel. DT/OT I and the evaluation and verification events that follow (B7, B9, B10, and B11) will have resulted in various changes in training requirements. The information about training requirements available at this point is considerably more detailed than that available during preparation of the initial OICTP (A7).

The updated ICTP incorporates all known training requirements, including resident, unit, and extension training, for all operator and maintenance positions. Requirements for new equipment training and training for introducing the new equipment to operational units are included (AR 350-XXX). These requirements will be specified by the materiel developer (See Event B17) and will include requirements for contractor/materiel developer training for service school staff and faculty.

During preparation of the ICTP, special consideration is given to the use of job training packages (JTP). "The JTP is guidance for the training required to qualify an individual in a field environment for a duty position within a specific MOS" (TRADOC Circular 351-8). JTPs can form the basis for self-study programs at institutions and can be integrated into Soldier's/Commander's Manuals.

The procedures for updating the OICTP are as follows:

- a. Examine each duty position within an MOS:
 - (1) Modify the existing training plan in light of verified training requirements.
 - (2) Verify/establish the need for specific training subsystem elements (training devices, SPAS material, TEC material, etc.) to support the training plan.

- (3) Add or delete training requirements on the basis of data developed during Event 311 and modify training plans accordingly.
 - (4) For each ITP verify/identify probable training setting, training form, and training media (see TRADOC Circular 351-4).
- b. Examine IER and output from Event 89 to identify changes in collective tasks.
- (1) Expand and refine Unit CT (Collective Training) and CT support requirements.
 - (2) Expand and refine CT concept for institutional and unit training, to include training for trainers and training managers.
 - (3) Identify and/or expand/refine training requirements for Opposition Force (OPFOR) personnel and for battle simulation and command and staff training.
 - (4) Identify and/or expand/refine requirements for crew/team training. Identify need for training package for high-risk collective tasks.
 - (5) Develop plans for identifying CT training objectives, CT training hierarchy, CT support materials, and CT test material (draft Army Training and Evaluation Program).
- c. Information and plans developed on the basis of Steps a and b above are organized into an Individual Training Plan and a Collective Training Plan. Each of these plans will be subdivided into institution training, unit training, and TEC training. Tables are constructed to show, for the Individual Training Plan, the MOSs by skill level that will be trained at the school level, at the unit level, and through self-training (TEC, SPAS/ETM, or ACCP material). Similarly, the Collective Training Plan is organized to show, by MOS and skill level, the training to be conducted at the school level and at the unit level. For each MOS/skill level line item of the individual and of the collective training plan, the use of new or revised training courses and material (SPAS/ETM, ACCP, SM/CM, etc.) will be indicated. The role of training devices, SQTs, and ARTEPs will also be indicated.
- d. A tentative implementation schedule will be prepared for both the individual and the collective training plan. In addition, milestone schedules are developed for each of the training system elements required in support of the training plan, including:
- (1) Schedules for institutional courses (both new and add-on)
 - (2) Correspondence courses (both new and add-on)
 - (3) Training equipment requirements

- (4) Training aids and instructional media requirements
 - (5) Training literature requirements
 - (6) Training device requirements
 - (7) Doctrinal, maintenance, and training or other publication/media requirements (new or revised)
 - (8) Opposing force (OPFOR) training requirements
- e. To complete the updated OICTP, support elements for implementing the training plan must be identified. The requirements for new equipment training (NET) must also be developed. General procedures for updating training support requirements are discussed under Event B13 (page IV-56), and general procedures for developing NET plans under Event B17 (page IV-70).

EVENT B13--UPDATE OF TRAINING SUPPORT PLAN

OVERVIEW

Purpose

During this event the training support plan prepared during Event A7 is updated. The Training/Support Plan identifies the training, logistic requirements, instructors and facilities, and other support requirements needed to implement training on a continuous basis. It contains developmental milestone and tentative schedules for all training subsystem elements, such as SPAS/ETM material, training devices, and Soldier's and Commander's Manuals. In addition, the Training Support Plan describes requirements for new equipment training (B17).

Relation to Other LCSMM/IPS Events

Event B13 is a continuation of Event B12. The output of this event is used to prepare the TQQPRI (Event B15) and is updated during Events B17-B19. Information developed during Event B13 provides inputs to the Validation Phase (CTEA/COEA) study and is incorporated into the Required Operational Capability (B20) and into the Acquisition Plan (B24).

TSM/AO Responsibilities

The TSM/AO coordinates the preparation of the Training Support Plan. The proponent school prepares the plan. Inputs are obtained from the LOGCEN school, the Soldier Support Center, and the material developer. TSM/AO staffing and coordination requirements are the same as for Event B12 (Figure IV-3, page IV-51).

Phasing

This event is accomplished concurrently with Event B12.

INPUT DATA/EVENT DATA BASE

An updated/revised set of detailed individual and collective training plans organized by MOS and skill level (from Event B12).

OUTPUTS AND END PRODUCTS

Information for incorporation into paragraph 7 of the ICTP (Event B12). This consists of a detailed individual and collective training support plan covering institutional, unit, and TEC training. Cost estimates and implementation/development schedules will be provided. Plans for new equipment training are included. Information and schedules will cover the period from about 3 months before OT II through 5 years after IOC (Initial Operational Capability, Event D5).

These plans and estimates provide inputs for preparation of the tentative QQPRI (B15) and a complete ICTP (B17). They should be available 1 month before the scheduled preparation of the TQQPRI.

REFERENCES

TRADOC Regulation 71-12, Total Systems Management - TRADOC System Manager

TRADOC Circular 351-8, Individual and Collective Training Plans for
Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System
Development, Volumes 1 and 2

DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook

ARI TR-78-A7, TSM Guide to Training Development and Acquisition of Major
Systems

Local (Proponent School) policy/SOPs for calculating requirements for
instruction, facility, etc.

EXAMPLES AND ILLUSTRATIONS

See illustrations provided under Event A7.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B13

The contents of an OICTP/ICTP, and in particular the support requirements, are described in TRADOC Circular 351-8. The detailed procedures for preparing a Training Support Plan are discussed in this handbook under Event A7 (page III-101). During Event B13 the training support requirements contained in the original OICTP are updated. The general steps are:

- a. Review changes that have been made in the individual and the collective training plans (output of B12). For each change, study the original estimates of support requirements and revise or delete these requirements as appropriate.
- b. Identify new training requirements, not covered in the original OICTP. For each of these new requirements, develop estimates of support requirements, using procedures described under Event A7 (page III-101).
- c. For both the individual and the collective training plans, estimate the following requirements by MOS and skill level: facilities, supplies and training material requirements, staff training requirements for training soldiers for OT II. These estimates should cover both preparing for and conducting institutional training. Forward estimates of staff training requirements to the materiel developer for use in preparing new equipment training plans.
- d. For both the individual and the collective training plans, develop rough estimates of logistic requirements (POL, administration/billeting, office supplies, repair parts, expendables). Forward this information to the LOGCEN for verification and refinement of the estimates.
- e. Develop cost estimates for each support equipment in accordance with procedures in AR 71-5 and/or AT 350-XXX.
- f. Prepare a detailed summary statements to describe each of the support requirements discussed in Section C-7 of the OICTP. (See illustration for Event A7).

EVENTS B14 and B15--TENTATIVE QUALITATIVE AND QUANTITATIVE PERSONNEL
REQUIREMENTS INFORMATION (TQQPRI)

OVERVIEW

Purpose

The purpose of the Tentative Qualitative and Quantitative Personnel Requirements Information (TQQPRI) is to provide as much as possible of the following personnel information to the decision authorities at Milestone II:

- a. Equipment to be operated and maintained, to include supporting special test equipment.
- b. Direct Annual Maintenance Man-Hours (AIMH) by MOS/SSI for each level of maintenance (organizational, DS/GS).
- c. The number of operators required to crew or operate the system.
- d. List of duty positions by MOS and title with duties and tasks for each.
- e. Requirements for MOS/SSI.
- f. Any contractor Individual Training Programs (ITP).

Relation to Other LCSMM/IPS Events

The tentative QQPRI is developed during Event B15 from data provided during the analysis of the personnel-related test issues examined in OT/DT I, from updated estimates developed during Event B14, and from the updated Training Support Plan, Event B13. Event B14 addresses only the training issues. The Logistic Support Analyses performed by the materiel developer, not shown on the IPS chart, provide the remaining data input requirements. Events B14 and B15 are the same as Event 26 of the LCSMM.

TSM/AO Responsibilities

DARCOM or other materiel developer will prepare the TQQPRI and send it through AMPSA to HQ TRADOC, with information copies to MILPERCEN and other

appropriate agencies. HQ TRADOC will task proponent schools for updated and refined requirements for training support planning to use as input to the TQQPRI. Based on the results of OT/DT I and other personnel studies, the proponent schools will provide comments and recommendations for revisions through the TSM/AO to HQ TRADOC, with information copies to the Soldier Support Center and LOGCEN. These activities are coordinated by the TSM/AO.

Phasing

The tentative QQPRI will be submitted by the materiel developer to the combat developer concurrently with DA Form 3362b-R, Basis of Issue Plan Feeder Data, as soon as possible after personnel test results of OT/DT I are evaluated.

INPUT DATA/EVENT DATA BASE

- a. Updated Training Support Plan (from Event B13). These plans are part of the draft ICTP and consist of a detailed individual and collective training support plan covering institutional, unit, and TEC training. Cost estimates and implementation/development schedules should be provided. Plans for new equipment training should be included. See output of Event B13.
- b. Personnel Training Input. This information consists of a verified list of tasks to cover during training (B9 output), verified personnel criteria (B10 output), and verified training requirements (B11 output).
- c. Logistic Support Analysis Reports/Records (from Event B12). These documents contain TASA and other data for all operator and maintenance tasks.

OUTPUTS AND END PRODUCTS

A tentative QQPRI and a DA Form 3362b-R. These documents are used to prepare the Tentative Basis of Issue Plan (TBOIP). The TBOIP must be available 6 months prior to submission of ROC/LR (Event B20).

REFERENCES

- AR 71-2, Basis of Issue Plans
- AR 611-1, NOS Development and Implementation

DARCOM Pamphlet 700-9-1, Guide for Integrated Logistic Support During the
Conceptual Phase

EXAMPLES AND ILLUSTRATIONS

- a. A TQQPRI is shown as Figure IV-4.
- b. Form 3362b-R is shown as Figure IV-5.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENTS B14, B15

Event B14 is an information-gathering activity and is the first step in the preparation of a TQQPRI in Event B15. Event B14 involves obtaining all available information on qualitative and quantitative requirements for personnel. Information about required duties and tasks, MOS and skill level requirements, and special personnel qualification requirements will be available from the outputs of Event B9 (Verification/Revision of Task List) and Event B10 (Verification of Personnel Criteria). Performance and training standards will be described in the outputs of Event B11 (Verification of Training Requirements) and in the updated draft ICTP (B12). Numbers of required personnel will be described in the draft ICTP (B12) and in the Training Support Plan (B13). Supplementing these sources of information are data developed or verified during the evaluation of contractor-generated personnel and task/skill data (Event B3).

The general requirements for preparing the tentative QQPRI are presented in AR 611-1, Chapter 3. The materiel developer is responsible for preparing the TQQPRI with input from the combat developer and trainer. Though the TSM/AO is responsible for coordinating the collecting of the information required by the materiel developer from both the combat developer and the trainer, only the trainer's role will be addressed here.

DRSAR-MAF-NW

SUBJECT: Final Qualitative and Quantitative Personnel Requirements Information
(QQPRI) - Computer Set, Field Artillery, Missile; and Computer Set,
Field Artillery

Commander
US Army DARCOM Maintenance Management Center
ATTN: DRXMD-MS
Lexington, KY 40507

1. Subject final QQPRI is forwarded in 13 copies in accordance with AR 611-1.
2. Attachments include the following:
 - a. Preliminary Maintenance Allocation Chart.
 - b. Basis of Issue Plan Feeder Data, DA Form 3362b-R.
 - c. DARCOM Form 1283, New Equipment Training Plan (NETP).
 - d. Section V of Acquisition Plan.

FOR THE COMMANDER:

J. W. MONTGOMERY
Chief, Fielding and Training Branch

1 Incl.
as (13 copies)

Figure IV-4. Sample Transmittal Letter for QQPRI

BASIS OF ISSUE PLAN FEEDER DATA <small>For use of this form, see AR 71-2; the proponent agency is ODCSOPS.</small>		1. BOIP PLAN NO.		2. <input type="checkbox"/> INITIAL <input type="checkbox"/> INTERIM <input type="checkbox"/> FINAL		3. PREPARATION DATE	
4. DESCRIPTION				(5. EST TO DATE 6. EST AVAIL DATE)			
A. GENERIC				QTR	FY	QTR	FY
B. NATIONAL							
7. LINE ITEM NUMBER				8. NATIONAL STOCK NO.			
A. DEV		B. STD		C. PRICE		D. SSN	
9. DESCRIPTION							
10. PRIMARY USAGE (Non-Technical Description of Major Uses)							
11. ASSOCIATED ITEMS (Use blank sheet if additional space req'd)							
LINE ITEM NO. (a)	NOMENCLATURE (b)			CC/SICC (c)	STD/NEW (d)	QTY (e)	
12. ITEMS TO BE REPLACED							
LINE ITEM NO. (a)	NOMENCLATURE (b)				COMP OR IN PART (c)	RECOM TO/ATC (d)	
13. DA APPROVED STATEMENT OF REQUIREMENT (LOA, LR, ROC, TDR, TDLR, Other DA Authority)							
14. CARD REFERENCE NO.		15a. ABA		15b. ARIC		16. EST COST FROM MODEL	
17. ROTE PROJECT OR TASK (If Applicable)							
A. NUMBER				B. TITLE			
18. REMARKS							
19. DEVELOPING AGENCY, LOCATION, FILE SYMBOL AND TELEPHONE NO.				20. TYPED NAME AND TITLE OF PREPARER			
				21. SIGNATURE			

DA FORM 3362b-R, 1 APR 78

Figure IV-5. BOIP Feeder Data Form, 3362b-R

The trainer will review the logistic support analysis data supplied by the materiel developer, and provide the information necessary to project MOS/SSI and training requirements. This information includes an estimate of the amount of formal or on-the-job training required in the proposed or revised MOS/SSI(s). Subject matter will be listed by broad categories, showing the scope of instruction and the approximate number of hours of training required.

This information is obtained from the trainer's review of the results of the personnel test issues examined in OT/DT I and his comparison of these results with the MOS requirements originally postulated during the evaluation of critical tasks. Events A6 through A8. These comparisons are performed in Events B7 through B11, and the resulting recommendations are forwarded to the materiel developer for incorporation in the TQQPRI.

EVENT B16--TENTATIVE BASIS OF ISSUE PLAN, TBOIP

OVERVIEW

Purpose

The purpose of the tentative Basis of Issue Plan is to provide an initial estimate of the planned placement of a new item of equipment and the anticipated personnel changes, as indicated by the requirements document or TQPRI, in the appropriate TOE(s), AR 71-2. It is used to inform all participants in the materiel acquisition process of the planned placement of the system and to provide HQDA with essential information necessary for initial planning and programming computations in the Structure and Composition System (SACS).

Relation to Other LCSMM/IPS Events

The TBOIP, Event B16, is developed from the TQPRI, Event B15, and from the analysis of the unit structure. It is Event 27 of the LCSMM.

TSM/AO Responsibilities

As the Army's principal combat developer, TRADOC develops, reviews, updates, and coordinates the TBOIP on equipment proposed to enter the Army supply system and forwards the results of these actions to HQDA. The TSM/AO is responsible for coordinating the activities of the combat developer and for staffing the TBOIP with the materiel developer and interested TRADOC agencies (see Figure IV-3, page IV-51).

Phasing

A copy of the TBOIP will be submitted concurrently with the requirements documents, ROC or LR. Input to the TBOIP comes from the TQPRI supplied by the materiel developer and must be staffed with all parties involved in the specific

acquisition process. Since such staffing, and approval of any comments and changes, takes a substantial amount of time, appropriate lead time should be allowed for the scheduled submission date.

INPUTS DATA/EVENT DATA BASE

- a. TQQPRI, from Event B14. This is a description of the numbers and qualifications of the persons required to man the system. The QQPRI is prepared by the materiel developer and provided concurrently with the initial Form 3362b-R to TRADOC for use during preparation of the BOIP.
- b. Unit Structure data. These are from a study that examines unit control, maneuver, and organic logistic elements with respect to aggregate strengths and major items of equipment in the type of unit(s) to be affected by the introduction of the new system. This is one of the studies conducted by the combat developer.
- c. New Equipment Personnel Requirements Summary (NEPRS). The NEPRS provides a single source of information on the personnel, training, and organizational implications of all new or modified materiel under development. NEPRS is prepared by MILPERCEN and is updated annually.

OUTPUTS AND END PRODUCTS

A tentative plan (TBOIP) describing the planned placement of new equipment items and estimates of manning requirements. The TBOIP provides HQDA with information needed for initial planning and programming computations in the Structure and Composition System (SACS). It also provides the basic data for pertinent personnel and unit studies. The TBOIP must be available for submission as an attachment to the ROC/LR.

The major output of the TBOIP is the information it contains for HQDA planning. The information will be updated as the Validation Phase progresses to the Development Phase and will continually be used as the basic data for pertinent personnel and unit studies.

REFERENCES

AR 71-2, Basis of Issue Plans

AR 71-9, Materiel Objectives and Requirements

AR 310-31, Management System for Tables of Organization and Equipment

AR 611-1, MOS Development and Implementation

DARCOM Regulation 11-27, Life Cycle Management of DARCOM Materiel

EXAMPLES AND ILLUSTRATIONS

See AR 71-2, Basis of Issue Plans, for format of the BOIP.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B16

The TBOIP is an integral part of the ROC or other requirements document. It is prepared and submitted by TRADOC to HQDA (DAMO-RQR) in support of all new systems. It is based on input of personnel requirements and unit structures obtained from the materiel developer and combat developer respectively. Each system will have a different resolution of the basic data at the time of submission, but it is imperative for TRADOC to incorporate the latest available information into this submission. To accomplish this, TRADOC (through the TSM/AO) must maintain close liaison with the developers of the basic data and BOIP feeder data.

The materiel developer prepares the TQOPRI and provides it to TRADOC concurrently with the initial DA Form 3362b-R, which contains most, if not all, of the personnel data required for the BOIP. This information is combined with the information obtained from combat developments on unit structure to prepare the BOIP in accordance with AR 71-2. The tentative BOIP is developed using preliminary estimates. Changes will occur in the BOIP during the Validation Phase on the basis of the results of testing and further evaluation, but this first estimate is important because it forms the basis for DA five-year planning.

The sequence of events relating to submission of the BOIP is presented in Figure IV-6 (from AR 71-2).

Instructions for preparing and revising DA Form 3362b-R, Basis of Issue Plan Feeder Data, are also presented in AR 71-2. Note that the BOIP, in addition to being a critical document in the LCSMM and IPS, is also an HQDA planning document whose input will have considerable bearing on the overall budget and force structure planning. For this reason it is important to have anticipated training implications that might arise from the introduction of the system and to have performed the appropriate personnel studies and trade-offs to develop best estimates.

Each BOIP must contain a statement on the rationale or justification considered when the BOIP was prepared or updated. This statement includes a summary of the organizational and operational concepts, as described in the DA-approved requirements document, and the rationale used in selecting alternatives. This information is not a line-by-line justification but rather a summary of the types of organizations (Infantry, Artillery, Signal, etc.) depicted in the BOIP and why the TOE requirements exist.

BOIP-I/Update BOIP-I

Submits the initial/interim DA Form 3362b-R and PQPRI to TRADOC concurrently during the preparation of LR or ROC, or as soon as an item of equipment is identified to satisfy an approved LOA.

Submits the BOIP (TOE and TRADOC TDA Tng RQR only) to HQDA concurrently with the LR or ROC (with copy to DARCOM (EARA)).

Approves, adjusts or disapproves and returns to TRADOC.

Pub if approved. Provides DARCOM (EARA) and interested activities copies.

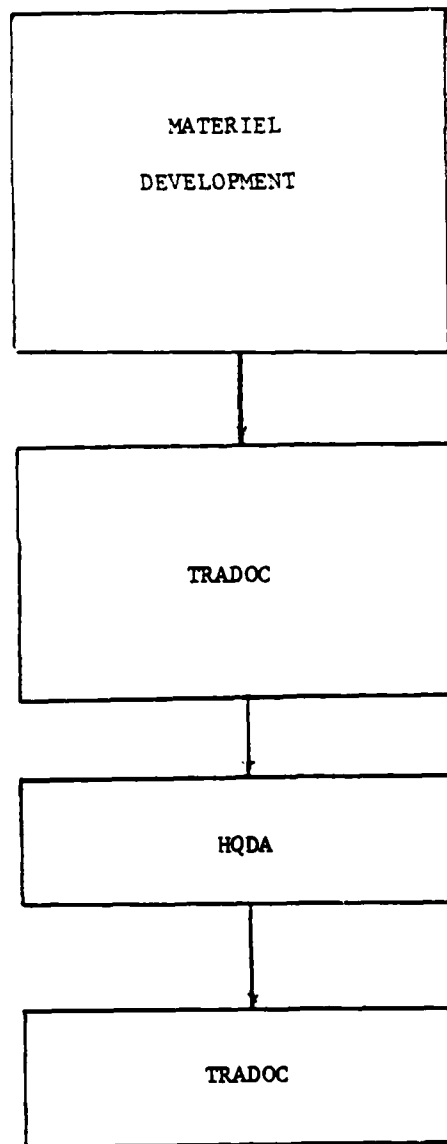


Figure IV-6. Event Sequence for BOIPT (From AR 71-2)

EVENT B17--ICTP/NETP PREPARATION

OVERVIEW

Purpose

Up to this point in the materiel acquisition process, all iterations of the ICTP have been in outline form and have been incomplete. The ICTP prepared during Event B17 accounts for all known training requirements. The ICTP will provide the information on training and logistics for incorporation into the ROC and the Acquisition Plan. It also will provide the basis for the statements of training requirements in the contract for full-scale engineering development.

Relation to Other LCSMM/IPS Events

Events B17, B18, and B19 correspond to Event 30 of the LCSMM. The products of these events provide detailed guidance for most of the subsequent training activities in the materiel development process. Event B19, which analyzes OT data on training, and Event 18, in which the Outline ICTP is revised, are performed first and provide input for Event B17. Events B21 and B22, which develop human performance standards and training criteria, also precede Event B17 and provide input.

TSM/AO Responsibilities

The training proponent is responsible for the final version of the ICTP. The materiel developer is responsible for preparing the New Equipment Training Plan (NETP). The LOGCEN school is responsible for identifying and costing the logistic support required in support of the training plans. The TSM/AO, provides coordination and reviews the final version of the ICTP within appropriate mission areas. Coordination and staffing requirements are described in TRADOC Circular 351-8 and under Event A7, this handbook. These requirements are outlined in Figure IV-3, page IV-51.

Phasing

Event B17 should be complete about 1 month before ROC/LR preparation is scheduled to begin. Note that in this handbook (see Figure IV-1) activities in Event B17 are preceded by activities in Events B19 and B18, and by Events B21 and B22.

INPUT DATA/EVENT DATA BASE

- a. A revised Outline ICTP (from Event B12).
- b. An updated Training Support Plan (from Event B13).
- c. A tentative QQPRI (from Event B15).

OUTPUTS AND END PRODUCTS

A complete ICTP contains training plans and support/cost estimates for all known training requirements, including new equipment training. The ICTP provides data required to (a) update the COEA/CTEA study conducted during the Concept Phase; (b) prepare Sections V and VI of the ROC (B20) and the Acquisition Plan (B24); and (c) provide the basis for statements of training requirements contained in the Full-Scale Engineering Development FSED. The ICTP will be available prior to the scheduled beginning of Event B20, ROC/LR Preparation.

REFERENCES

- AR 71-5, Introduction of New or Modified Systems/Equipment (to be replaced by AR 350-XXX)
- TRADOC Circular 70-80-1, Training Device Development
- TRADOC Circular 350-3, Individual/Collective Training and Development Glossary (TBP)
- TRADOC Circular 351-3, Individual Training Plan (TBP)
- TRADOC Circular 351-4, Job and Task Analysis (TBP)

TRADOC Circular 351-5, SQT Policy and Procedures

TRADOC Circular 351-8, Individual and Collective Training Plans for
Developing Systems: Policies and Procedures

TRADOC Circular 351-XXX, Collective Training Plan (TBP)

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System
Development

ARI TR-78-A7, TSM Guide to Training Development and Acquisition of Major
Systems

Reference Letter, ATTSC-DS-DPA, 6 February 1979, Subject: Standard Training
Paragraphs for Requirements Documents and Operational Test Training
Issues

Braby, R., et al., A Technique for Choosing Cost-effective Instructional
Delivery Systems

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B17

During this event the training proponent previously developed are organized into the ICTP format. This format is shown in Figure III-17 page III-106. The paragraphs and subparagraphs of the ICTP are illustrated in the handbook section on Event A7 (pp 106 through 183).

As a first step, the requirements for new equipment training are obtained from the materiel developer. These requirements are described in the form of a NETP. The NETP will account for the need to train instructors and key personnel (I&KP Training Plan), staff planners, OT II players, and personnel of the units to first receive the new materiel. In addition, plans will be made for New Materiel Introduction Training, which is training to brief major commands on the new system.

As a second step, the logistic requirements and costs prepared by the LOGCEN school are obtained and incorporated into the ICTP. These support requirements must cover ammunition, POL, office supplies, repair parts, and similar elements at both school and unit levels.

For each major logistic support requirement, subparagraphs will describe the nature of the requirements in detail. Supporting documents will be appended to the ICTP.

To complete the ICTP, updated statements will be prepared on the strategy by which the training is to be implemented and on how the training program is to be structured.

EVENT B18--REVISION OF OUTLINE ICTP

OVERVIEW

Purpose

During Event B19, which is accomplished ahead of Event B18, an updated inventory of high-risk and low-risk tasks is developed. For each of these tasks, performance requirements are identified. For new tasks added to the inventory, training or performance support plans are developed. In Event B18, the preparation of training plans for all tasks selected for training is completed and the Outline ICTP is revised. Essentially this involves updating the training support plans developed during Event B13 to account for those new task training requirements identified during Event B19. In addition, preparation of training device requirements is emphasized.

Relation to Other LCSMM/IPS Events

This event is part of LCSMM Event 30. It should be performed concurrently with UPS Events B19, B21, and B22, and precedes Event B17.

TSM/AO Responsibilities

The proponent school will perform the activities surrounding Event B18. In his capacity as a coordinator, the TSM/AO alerts the materiel developer and the LOGCEN school that inputs to the final version of the ICTP (Event B17) will be required by a certain date.

Phasing

This event must be completed prior to the scheduled date for preparing the ICTP/NETP (B17).

INPUT DATA/EVENT DATA BASE

- a. An updated draft ICTP (from Event B12).
- b. An updated Training Support Plan (from Event B13).

c. An updated list of training requirements (from Event B19).

OUTPUTS AND END PRODUCTS

A completely updated training support plan except for inputs from the materiel developer and from LOGCEN. The plan describes how training on the new equipment will be incorporated in CONUS schools, training centers, and units world wide. The plan details all training support required for the new system. It also describes the training required, both individual and collective, for each MOS and skill level associated with the system. Five-year cost estimates are provided, and developmental milestones are presented for all major elements of the training subsystem. These plans are used to prepare the ICTP that must be submitted along with the ROC. Most of the material developed during this event and Event B19 will be attached as supporting appendixes to the ICTP. This material should be available 1 or 2 months before preparation of the ROC begins.

REFERENCES

AR 71-5, Introduction of New or Modified Systems/Equipment to be replaced by AR 350-XXX)

TRADOC Circular 70-1, Training Device Development

TRADOC Circular 350-3, Individual/Collective Training and Development
Glossary

TRADOC Circular 351-3, Individual Training Plan

TRADOC Circular 361-4, Job and Task Analysis

TRADOC Circular 351-5, SQT Policy and Procedures

TRADOC Circular 351-8, Individual and Collective Training Plans for
Development Systems: Policies and Procedures

TRADOC Circular 351-XXX, Collective Training Plan

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System
Development

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

Training Device Requirements Documents Guide: A Procedures Handbook for Directorate of Training Developments Project Offices for Devices (DTDPDD), PM TRADE, Naval Training Equipment Center and Army Training Support Center

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B18

During this event draft ICTP and training support plans developed during Events B12 and B13 are updated to account for any new training requirements identified during Event B19. The procedures are the same as those discussed under Events A3 (p. III-14) and B13 (p. IV-56). Portions of these procedures also are reviewed in TRADOC Circular 351-8.

Each time an Individual and Collective Training Plan is updated, more detailed information is developed on training device requirements. So far in this handbook, training devices have been discussed as though they were acquired as part of the support package for the materiel system. It has been assumed that the need for training devices noted in the Letter of Agreement (Event A5) will be addressed in the ROC (Event B20). This is not always the case, especially for training devices that are different technically from the system they represent (e.g., maintenance and flight simulators).

According to TRADOC Circular 70-80-1, if a training device for a developing system is a modification or variation of the system itself (nonoperable equipment, inert ammunition, etc.) and does not warrant a separate engineering development, the device requirement can be specified as part of the LOA and the ROC/LR for the system.

On the other hand, if the training device requires training characteristics that are not well defined or involve some technical risk (as does the development of a simulator), then the training device will be treated as a separate

developmental effort. In such instances a separate LOA will be prepared for the device, and the device will be identified in the AD Contract as a separate deliverable requiring its own DT/OT I. If at all possible, the device will be ready for assessment during OT I and is evaluated in the Independent Evaluation Report (IER).

For the developing system a Training Device LOA (TDLOA) is jointly prepared by the combat training and the materiel developers. It should outline the basic agreement for further investigation of the potential training device.

The results of OT I demonstrate the need for the device and the effectiveness of the brassboard version of the device, a Training Device Requirement/Training Device Letter Requirement (TDR/TDLR) will be prepared at about the same time that the ROC/LR for the developing system is prepared. The ROC will contain justification for the device and outline its developmental schedule and its cost.

As described in TRADOC Circular 70-80-1, TDLOA and TDR/TDLR are processed like similar documents for development systems--in accordance with AR 71-9 and the LCSMM as outlined in DA Pamphlet 11-25. A modified Cost and Training Effectiveness Analysis (CTEA) is required in support of a TDLOA, and a full-fledged CTEA must be prepared in support of a TDR/TDLR.

If at all possible, the developmental schedule for a training device will parallel that of its parent system. This makes it feasible to assess the device as part of OT I and II for the development system.

EVENT B19, B18--OT DATA ON TRAINING/REVISION OF OUTLINE ICTP

OVERVIEW

Purpose

As the result of OT/DT I, numerous changes may be made in the materiel design and in the tactical and logistic support concepts for the equipment. OT I may also have demonstrated a need for changing certain training concepts and for modifying the list of high-risk tasks selected for training. During Event B19, the final inventory of tasks selected for training is developed. This inventory reflects changes in training requirements resulting from OT/DT I. During Event B18, as described previously, the OICTP is updated on the basis of this new task listing.

Relation to Other LCSMM/IPS Events

Events B19 and B18 are critical events in that they provide the latest information available on training requirements. This information forms the basis for the ICTP prepared during Event 17, which then is incorporated into the ROC (Events B20 and 31 of the IPS and LCSMM models, respectively).

TSM/AO Responsibilities

The training proponent is responsible for developing the final list of high-risk tasks and for using this data to update the OICTP. However, inputs are required from LOGCEN, the Soldier Support Center, and DARCOM. The TSM/AO coordinates the preparation of these inputs.

Phasing

This event begins about 3 months before the scheduled beginning of Event B20 (Preparation of the ROC/LR) and is completed within that time. Events B18, B19, B21, and B22 are conducted concurrently and by the same persons.

INPUT DATA/EVENT DATA BASE

- a. Information on changes in materiel design. Changes in materiel design should be reflected in equipment drawings and in recent LSA data for operator and maintenance personnel. The LSA reports are available from contractor on a continuing basis.
- b. Information on changes in tactics. That portion of the IER prepared by the combat developer should discuss proposed changes in tactics. Follow-on reports and memoranda should have been prepared describing the changes that have been accepted. Changes in tactical concepts should be finalized some months before the ROC is prepared.
- c. Information on changes in logistic concept. Documents describing the latest maintenance support concepts, including any proposed changes in the IER prepared by the Operational Tester should be prepared by the LOGCEN school; a few months before the ROC is prepared.
- d. An updated list of tasks. A list of tasks performed by individuals, categorized by MOS and skill level, and a list of tasks performed by crew or teams. Data on individually performed tasks can be obtained from the contractor, and on collectively performed tasks from the combat developer. They should be available 2 to 3 months after OT I, following completion of Event B9.

OUTPUTS AND END PRODUCTS

For each MOS and skill level: (a) a list of high-risk tasks subdivided into individually and collectively performed tasks; and (b) a list of low-risk tasks also subdivided into individual and crew tasks. For each task, information should be presented regarding how training is to be accomplished and the requirements for support of the task. For each task, minimum performance requirements should be established.

Information will be used to update training support plan for OICTP (B18), for preparing Human Performance Standards (B21), and for establishing training criteria (B22). Events B18, B19, B21, and B22 are conducted concurrently and by the same persons. They must be completed in time to incorporate their outputs into an ICTP (Event B17).

REFERENCES

AR 700-127, Integrated Logistic Support

DARCOM Supplement #1 to AR 700-127, Integrated Logistic Support

TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training

See also References for Event B17 (p. IV-70).

GENERAL PROCEDURES FOR ACCOMPLISHING EVENTS B19 and B18

The OICTP updating that followed preparation of the TRADOC IER (Events B12 and B13) concentrated primarily on high-risk tasks. Attempts were made to incorporate into that OICTP the impact of proposed changes in materiel, equipment operation, and tactics. However, some of these changes probably were not obvious when Event B12 began. The current OICTP update (B18) takes place some months later and is the final version of the ICTP produced before the ROC is prepared (B20). Therefore, the ICTP resulting from Events B17 through B19 must be as current as possible. It must include the impact on training of (a) changes in materiel design, (b) changes in operation and support concepts and procedures, (c) changes in tactical concepts, and (d) any personnel studies conducted as the result of OT I findings.

Training-related activities during Events B17 through B20 will begin the transition from emphasis on high-risk tasks to the development of a total training subsystem. This requires the development of an inventory of low-risk tasks and the identification of training materials and job performance aids required in support of these tasks.

The general procedures for preparing a task inventory, for identifying high-risk tasks, and for updating an OICTP have already been reviewed in this handbook (Events A6, A7, B2, and B12). During Event B19 the emphasis should be on

developing two sets of task inventories. One list will consist of tasks that, because of recent changes in materiel, operator requirements, etc., no longer need to be considered for training. A second, and probably much longer, list will consist of additional tasks that need to be considered for training and therefore need to be incorporated into the OICTP. To develop these two sets of tasks the following steps are suggested:

- a. Through the materiel developer, obtain the most recent changes in equipment design. The impact of these changes should be reflected in the latest LSA data prepared by the contractor. These data are continually updated by the contractor and are available to the training proponent. The LSA information also reflects changes in operator and maintenance personnel requirements.
- b. From the combat developer, obtain the latest information on the tactical concept for the equipment, the organizational structure of the employing unit, and so on.
- c. From the logistic proponent, obtain the latest information about changes in the logistics support concept.
- d. On the basis of the foregoing information, identify those operator and maintenance tasks that are no longer required; also, identify new operator and maintenance tasks. Comparisons between LSA data provided by the contractor prior to OT I (B2) and the most recent LSA data provide the basis for these actions.
- e. For the new tasks, determine whether a new job position, MOS, or skill level appears to be required, or whether the task will be performed by persons holding already identified MOS and skill levels.
- f. For each new individually performed task, decide whether it is a high-risk or a low-risk task. If it is high-risk, identify the means by which the task will be trained. If it is low-risk, determine whether job aids or self-instructional material are needed.
- g. Identify those new tasks that are related to unit or crew training. Identify high- and low-risk tasks. Develop a training plan for each high-risk task. Identify the support required, if any, for low-risk tasks.

- h. Compile a complete inventory of low-risk tasks. This inventory should have been developed originally by the contractor as part of the TASA data provided during Event B2. Using recent LSA data, update this inventory and identify those tasks that need to be covered by some sort of training or by performance aids.
- i. As a final step in this process, revise the task inventories already developed for each MOS and skill level to incorporate additions and deletions developed during Event B19.

Two of the inputs to Event B19 are (a) an updated list of individual tasks supplied by the contractor, and (b) an updated list of collective tasks provided by the combat developer. Accompanying each task in these lists should be a variety of data typical of those generated by the FEA/TASA for individual and for collective tasks. These data should include a description of Human Performance Standards (for individual tasks) and Crew Performance Standards (for collective tasks).

During the development of a training plan for a task, a decision must be made regarding the degree to which the training criteria for that task will match the field performance standards for the task. This process, determining the degree of similarity between performance standards and training criteria, is accomplished during Events B21 and B22. These events should be performed concurrent with Event B19.

EVENT B20--REQUIRED OPERATIONAL CAPABILITY (ROC)

OVERVIEW

Purpose

The Required Operational Capability (ROC) is a document that presents the minimum operational, technical, logistical, and cost information essential for making decisions related to the development and procurement of a system. It includes an assessment of personnel factors that will have an impact on further full-scale development of the system. These factors include:

- a. Personnel interface with existing and projected equipment.
- b. Training and training device requirements.
- c. Desired system safety and human engineering characteristics.

This document contains the information necessary for the Acquisition Plan (AP) and the basis for the Decision Coordinating Paper (DCP) used in the ASARC/DSARC review process. All supporting studies included as appendixes or used as input to the ROC must be revised and updated with the latest information available, in particular that gained from OT I.

For low value items a Letter Requirement (LR) may be used in lieu of a ROC.

Relation to Other LCSMM/IPS Events

The requirements document, ROC or LR, presents in a concise format the updated information prepared during all the events from B15 to B22 of the IPS (Events 24 through 30 of the LCSMM).

TSM/AO Responsibilities

The TRADOC user proponent is responsible for preparation of the requirements document. As TRADOC representative, the TSM/AO should coordinate these activities and also, at a minimum, should:

- a. Ensure that performance standards and testing objectives are updated.
- b. Ensure that the OICTP is updated and is in sufficient detail to allow reasonable life cycle costing.
- c. Ensure that the above data are provided to organizations responsible for preparing cost estimates.
- d. Ensure that COEA and supporting CTEA reflect the latest estimates available after completion of OT I.

Phasing

Plans for preparing a ROC should be formulated as soon as development of a cost-effective system appears to be feasible. The ROC should be available for distribution to interested agencies about 6 months prior to the scheduled date for ASARC/DSARC II.

INPUT DATA/EVENT DATA BASE

- a. ICTP: See Event B15 (p. IV-59)
- b. BOIPT: See Event B16 (p. IV-65)
- c. COEA: This is an update of the COEA performed for the Concept Formulation Package, Event A9, using the data obtained during the performance of OI I. The update is accomplished by the combat developer.
- d. CTEA: This is an update of the CTEA performed in support of the CFP, using information gathered during OT I. It is accomplished by the training developer.

OUTPUTS AND END PRODUCTS

Along with information gathered from independent evaluations and reviews of the OT data, the ROC forms the basis for revision of the Acquisition Plan, which is the basis for the development contract.

As a decision document, the ROC provides the basic information necessary to develop the Decision Coordinating Paper (DCP) required by the ASARC/DSARC process.

REFERENCES

AR 71-9, Materiel Objectives and Requirements

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

EXAMPLES AND ILLUSTRATIONS

The instructions for the format for Required Operational Capability (ROC), as set forth in Appendix E, AR 71-9, are reproduced in Figure IV-7.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B20

The Required Operational Capability (ROC) document must provide all the information necessary to allow a decision to be made on further development of the system. The ROC is a concise summary of the system characteristics, based on a series of evaluations using the results of OT/DT I to update previous estimates. The summary document itself is only a few pages, usually about four, but is supported by updates of all studies used to prepare the Concept Formulation Package, Event A9, (p. III-197).

The TSM/AO's basic responsibility is to review these supporting documents to ensure consistency and the inclusion of the latest basic data obtained during OT I. The documents of prime concern are the TQQPRI, TBOIP, ICTP/NETP, and the COEA/CTEA. These documents, initially prepared during the Conceptual Phase, must be revised and refined to the extent that no major technological issues related to personnel or training remain to be resolved and that the minor remaining issues are identified for further evaluation during OT II.

The procedures for updating the TQQPRI, TBOIP, and ICTP are discussed under Events B15, B16, and B17, respectively. As discussed earlier with respect to

APPENDIX E, AR 71-9

FORMAT FOR REQUIRED OPERATIONAL CAPABILITY (ROC)

A ROC submitted to DCSOPS for approval will be in the format provided below. The quantity of information in the ROC should be limited to that necessary for a HQDA decision. For most systems, four pages is a reasonable goal. Information will be submitted to the extent that it is available to the originator of the ROC.

1. Statement of the need.
 - a. A descriptive title and brief statement of the requirement.
 - b. CARDS reference number (to be assigned by ODCSOPS during ROC approval process).
2. Time frame. A statement of the time frame in which the new or improved system is required. The IOC date will be included when known.
3. Threat/operational deficiency. A brief paragraph which states concisely the capability goal, threat or operational deficiency which the system will achieve or overcome.
4. Operational/organizational concept. A brief paragraph which states how the equipment will be used, geographical areas of use, and the type of unit and the estimated number of personnel that will use and support the equipment.
5. Essential characteristics. State only those principal performance characteristics, and reliability, availability, and maintainability (RAM) characteristics which are necessary to describe the operational features of the system. Essential performance and reliability characteristics will be expressed in bands of performance. Those characteristics which are not suitable for banding will be stated as single value characteristics. During development of these characteristics, consideration should be given to inclusion of commercial, other service, NATO or other Allied nation characteristics of existing or programmed systems, with a view toward establishing the basis for interoperability, co-production or standardization. Bands of performance should be sufficiently flexible to accommodate consideration or competing systems of other service or Allied nations. Adjustment of the stated bands of performance, or single value characteristics will be made only after the combat developer and the materiel developer agree that such changes are necessary and approved by DCSOPS.
6. Technical assessment. A brief paragraph which provides an analysis of the technical effort required. Major areas for full-scale development effort will be addressed in terms of scope, technical approach, and associated risks.

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Figure IV-7. Format for Required Operational Capability (ROC)

(From AR 71-9)
IV-86

7. Logistic assessment. This paragraph will identify logistic considerations which have an impact on further full-scale development of the materiel and logistic support systems. Such considerations will have evolved from the advanced development effort and include:

- a. A baseline logistic support concept.
- b. Potential logistic problem areas.
- c. Preferred limits on the need for logistic support element resources.
- d. Current and projected changes to pertinent supply, maintenance, and transportation systems and procedures (e.g., resupply of ammo consideration).

8. Other service or Allied nation interest. A discussion of other service, NATO, or other Allied nation interest in the Army development/procurement. Provide data on other service or Allied developments with view toward establishing potential for standardization/interoperability or co-production.

9. Training assessment. Discuss the need for training devices, New Equipment Training Teams (NET) operator and maintenance personnel training and integrated Technical Documentation and Training (ITDT) requirements.

10. Life cycle cost assessment. An estimate of total life cycle costs will be provided using primarily summary level parametric estimating techniques. This assessment will be expressed in terms of the major cost categories of research and development, investment nonrecurring, investment recurring, and operating. Also included will be the design to cost goals. To the extent feasible, this assessment will reflect the estimated cost of major items or components below the system level.

Page 2 of 2

Figure IV-7 (continued)

the LCSNM in general, the sequencing of these events is not always the same. These documents are frequently being developed in parallel and certain trade-offs are agreed upon during the updating process. As a general rule, the updated CTEA requires the input from the updated TQQPRI, as does the TBOIP. The ICTP requires the input of the TQQPRI as evaluated in the CTEA, as does the COEA.

Using the same methodology previously employed in support of Event A10, both the COEA and the supporting CTEA should determine whether significant differences exist because of the introduction of new data from OT I. If difficulties in implementing the proposed training plan are identified, a second CTEA may be required to assess alternative media approaches to training the MOS/SSI selections of the TQQPRI. If this is the case, the results of both analyses should be incorporated in the supported COEA.

EVENTS B21 and B22--HUMAN PERFORMANCE STANDARDS AND TRAINING CRITERIA

OVERVIEW

Purpose

The purpose of these events is to update field performance standards for the inventory of tasks selected for training and to establish training criteria for each task.

Relation to Other LCSMM/IPS Events

These two events are part of the whole process of updating the OICTP and must occur each time new tasks are selected for training and/or when training plans for a particular task are revised.

TSM/AO Responsibilities

Establishing human performance standards is the responsibility of those who identify individual or collective task requirements. The training developer is responsible for establishing training criteria but should coordinate this activity with the contractor or combat developer as appropriate. The TSM/AO will assure that the standards and criteria are identified and reflected in the ROC/LR.

Phasing

These events should be accomplished as part of the process of updating the OICTP.

INPUT DATA/EVENT BASE

See Event B19 (p. IV-78).

OUTPUTS AND END PRODUCTS

This event will not produce a separate output. Rather it will generate one of the outputs of Event B19, namely, training criteria for each task selected

for training. The information developed during this event is used as input to Event B18, a continuation of the OICTP update.

REFERENCES

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

ARI TR-78-A7, TSM Guide to Training Development and Acquisition for Major Systems

GENERAL PROCEDURES FOR ACCOMPLISHING EVENTS B21 and B22

Each time a new task requirement for humans is identified, the performance standards for that task must also be established. These standards are first determined by the contractor (B2), as part of the FEA/TASA data provided to the training and materiel developers. During Event B3 the training developer verifies the standards for individual tasks and the combat developer verifies the standards for collective tasks.

As the result of OT I and subsequent changes in materiel design, operator/crew requirements, and tactics, human performance requirements for some tasks may change. These changes in requirements will be reflected in subsequent Logistics Support Analysis (LSA) data prepared by the contractor or in new mission descriptions prepared by the combat developer.

Human performance standards or criteria describe field performance requirements for tasks. These standards also serve as the criteria for judging acceptability of performance. As described in TRADOC Circular 351-4, performance standards can include any combination of the following:

- a. Process standards--when the task must be performed in a certain sequence of steps or task elements.
- b. Product standards--when the output/product must meet certain specifications.
- c. Time standards--when the task must be completed within a certain period of time.

During the early part of Event B19, as noted earlier, the training developer will assure that, for each individual or collective tasks selected for training, individual/crew performance standards have been established. If this has not been accomplished, the information will be requested from the contractor or the combat developer as appropriate.

Training programs or SPAS/ETM material seldom fully prepare individuals to meet field performance requirements. The training criteria established for training programs usually are set at a lower skill level than that required for acceptable field performance. It is usually assumed that training will prepare a person so that, with additional practice on the job, he can meet performance requirements. Similarly it is usually specified that SPAS/ETM material be designed so that users of the material can perform accurately but not quickly. With continued practice in the use of SPAS/ETM material, the performer becomes more skillful (e.g., performs faster).

The procedures for establishing training criteria or standards for training programs and/or SPAS material are not well defined. In general they involve:

- a. Determining the importance of performing correctly the first time the task is performed on the job.
- b. Determining the time between end of formal training and the requirement to perform task in the field.
- c. Determining opportunities for training/practice in the field prior to performing the task.
- d. Determining the extent to which the initial task performance will be supervised.

Generally speaking, the training criteria for a task will be set below those required for acceptable field performance when there are opportunities for practicing the task in the field under supervision, and when accuracy but not speed is important the first few times the task is performed. If both speed and

accuracy are required when the task is first performed, then the training criteria should be similar to performance standards. This applies especially for high-risk tasks or dangerous tasks that may be performed a considerable length of time after formal training. Often an effort is made to overtrain on such tasks to compensate for some decrement in performance due to lack of practice.

Training criteria often vary depending on the stage of learning. During the early period of training standards may be low, then gradually raised as training progresses. Toward the end of training the standards may exceed those required on the job.

EVENT B23--REVIEW OF IER OT/DT I

OVERVIEW

Purpose

The purpose for reviewing the Independent Evaluation Report (IER) is to ensure command (TRADOC) agreement with the results and conclusions. "Any interested agency or command, including those senior to the tester, may forward to decision reviews the results of their reviews and recommendations" (AR 70-10).

Relation to Other LCSMM/IPS Events

The review of the IERs by TRADOC, Event B23 in the IPS, is not specifically identified in the LCSMM but is implicit in Events 35 and 36.

TSM/POC Responsibilities

The IERs are the responsibility of the materiel developer and operational tester with assistance from the training developer, combat developer, and logistician. This assistance is in the form of a review and evaluation of that part of the Test Report pertinent to each individual agency. The TSM coordinates his information exchange, notes any unresolved differences in conclusion among agencies, and forwards the differences with recommendations on the command position to HQ TRADOC for submission to ASARC II if necessary.

Phasing

The IER must be submitted to ASARC 2 weeks prior to initial review. The TRADOC review of the IER therefore will be completed at least 1 month before submission to allow time to resolve differences and to develop a command position if necessary.

INPUT DATA/EVENT DATA BASE

- a. Test Reports for DT/OT I (from Event B7)

- b. Independent Evaluation Reports. A consolidation of all studies and evaluations associated with the test results and test reports.

OUTPUTS AND END PRODUCTS

- a. Concurrence or non-concurrence with IERs. Non-concurrence requires separate submission to ASARC.
- b. Test issues for further evaluation during OT II.

REFERENCES

AR 10-4, U.S. Army Operational Test and Evaluation Agency
AR 70-10, Test and Evaluation During Development and Acquisition of Materiel
AR 71-3, User Testing
OTEA, Operational Test and Evaluation Handbook

EXAMPLES AND ILLUSTRATIONS

Figure IV-8, shows a sample IER format from AR 71-3.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B23

The references cited and the illustrations provided are pertinent to the Independent Evaluation Report itself rather than to a review of this document. There are no known formal procedures for reviewing an IER. The basic purpose of the review is to ensure concurrence with the results and conclusions. If concurrence cannot be reached at the IER draft stage, then a command position on results and recommendations must be reached and submitted to ASARC.

In general, the sequence from the development of the Independent Evaluation Plan (IEP) to submission of the IER occurs in the following manner. The materiel developer and the operational tester each prepare a master plan for respective evaluation responsibilities. Each asks all the involved commands and agencies for their test issues and test objectives. These are incorporated in the Test Design Plan and the Detailed Test Plan, and the tests, OT/DT I, are

INDEPENDENT EVALUATION REPORT

CONTENTS

Executive Summary

1. Purpose and Scope
2. Test Item
3. Adequacy of Testing
4. Operational Test Limitations
5. Operational Issues
6. Major Findings
7. Other Findings
8. Conclusions

Section 1.0 General

Authority
Purpose and Scope
Data Sources
Background
Adequacy of Operational Testing
Threat

2.0 Operational Test Analysis

Operation Issue Analysis
Item Tested
Operational Test (OT I, II, or III) description
Evaluation of Operational Issues

3.0 Performance Issues

4.0 Logistic Support Issues

5.0 Reliability, Availability, and Maintainability

6.0 Survivability Issues

7.0 Training Issues

8.0 Organization Issues

9.0 Conclusions

Appendix A Future Testing Requirements

Abbreviations and Acronyms

Operational Issue Index

Figure IV-8. Sample Format for Independent Evaluation Report

(From AR 71-3)
IV-95

conducted. Test reports are then prepared by the respective agencies, incorporating the test results, test conditions, and an analysis of test results versus test objectives.

When the report is approved, it is disseminated to the agencies submitting the test issues and to the involved commands and agencies for further evaluation. Their comments and evaluations will be considered, together with the test report, in developing the IER. Should an agency or command other than the tester disagree with one or more conclusions of the IER, it must develop a command position for forwarding to the ASARC.

It is the responsibility of the TSM/AO to ensure that the information flow required by this process is maintained and responsive and to assist where non-concurrence is found. If resolutions among non-concurring TRADOC agencies cannot be achieved during the draft stage of the IER, then the TSM/AO should assist in preparing a TRADOC command position for ASARC II.

EVENT B24--ACQUISITION PLAN (AP)

OVERVIEW

Purpose

The Acquisition Plan (AP) is an update and refinement of the Outline Acquisition Plan, Event A10, based on the information gained from OT/DT I and supporting studies. Its purpose is to provide the ASARC/DSARC review process with the long-term implications of the procurement of the system and with the specifics for the Full-Scale Development contract. With this information the reviewers will be able to make a judgment of whether to continue the program.

Relation to Other LCSMM/IPS Events

The Acquisition Plan, Event B24 in the IPS, is called a Development Plan (DP), Event 33, in the LCSMM. The difference in terminology does not affect the desired content.

TSM/AO Responsibilities

The preparation of the Acquisition Plan is the responsibility of the materiel developer, usually DARCOM, in coordination with the TRADOC proponent. The TSM reviews all supporting material dealing with personnel and training, most of which was developed during preparation of the ROC. He ensures that the input data are consistent with the latest available. Also, the TSM/AO will assist the materiel developer in obtaining inputs from other TRADOC agencies, and will assure that the draft AP is staffed among all interested TRADOC agencies. This latter requirement is outlined in Figure IV-2, page IV-51.

Phasing

The Acquisition Plan is prepared immediately after the STF/SSG review of the ROC.

INPUT DATA/EVENT DATA BASE

- a. ROC, Event B20 (p. IV-83).
- b. IER, Event B23 (p. IV-93).

OUTPUTS AND END PRODUCTS

The Acquisition Plan provides the basis of information for development of the Army Program Memorandum (APM) and the Decision Coordinating Paper (DCP). These documents are the principal decision-recording documents on the system for which the Secretary of the Army and the Secretary of Defense, respectively, are the final approval authorities.

REFERENCES

- AR 15-14, Systems Acquisition Review Council Procedures
- AR 70-1, Army Research, Development and Acquisition
- AR 70-27, Outline Development Plan, Development Plan, APM, DPM, and DCP
- AR 700-127, Integrated Logistic Support
- TM 38-703 Series, Integrated Logistic Support
- TM 38-710, Integrated Logistic Support Implementation Guide for DOD Systems and Equipment

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B24

The Acquisition Plan is essentially an update of the Outline Acquisition Plan that was prepared during the Concept Phase (A10, p. III-206). The OAP is now modified on the basis of data gathered on the test issues identified at Milestone I and investigated during OT/DT I. The data on the personnel and training issues are presented in Section V of the AP, Plan for Personnel and Training Requirements. They include identification of new skills, individual and crew training requirements, SPA requirements, training devices, training facilities, and associated schedules related to all aspects of the development.

The procedures for updating the OAP to form the Acquisition Plan have been covered under the previous discussions of supporting documents. The format of the AP is the same as the OAP, Event A10 (p. III-206). Since the AP is the information source for the ASARC/DSARC, more guidance about content can be gained from Appendix B, AR 15-14, checklist for Milestone II Reviews (included in Event B26 as Figure IV-9).

EVENT B25--INPUT FOR INITIAL RECRUITING AND TRAINING PLAN (IRTP)

OVERVIEW

Purpose

The Initial Recruiting and Training Plan (IRTP) is a reverse planning document which predicts the critical dates for personnel and training actions prior to the deployment of the new system. The plan assists all agencies involved in monitoring the flow of personnel and training products and provides a means for planning the interaction with other systems having similar requirements.

Relation to Other LCSMM/IPS Events

This event relates more to annual planning than to the system development cycle. The IRTP is an output of the IPS based on the QQPRI and ICTP and is used both as a planning document and as input to the annual updating of the New Equipment Personnel Requirements Summary (NEPRS).

TSM/AO Responsibilities

The IRTP is normally prepared by MILPERCEN on the basis of information provided by the proponent TSM/AO and the Soldier Support Center, and the integration of these inputs with the requirements of other systems and organizations.

Phasing

The TSM/AO will ensure that any updated information on personnel and training requirements is made available to MILPERCEN as it develops.

INPUT DATA/EVENT DATA BASE

- a. QQPRI, Event B15 (p. IV-59).
- b. ICTP, Event B17 (p. IV-70).
- c. NEPRS, Event B16 (p. IV-65).
- d. TSP, Event B13 (p. IV-56).

OUTPUTS AND END PRODUCTS

- a. IRTP
- b. Updated NEPRS

REFERENCES

- AR 611-1 Military Occupational Classification Structure, Development and Implementation
- Army Circular 601-70, Total Army Recruiting Support Plan
- TRADOC Regulation 600-4, Integrated Personnel Support, Appendix E, Initial Recruiting and Training Plan

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B25

The responsibility for preparing the IRTP rests with MILPERCEN. According to AR 611-1, MILPERCEN is responsible for, among other things:

- a. Acquiring data and preparing specifications for occupational and personnel requirements during development of new or modified systems.
- b. Keeping the New Equipment Personnel Requirements Summary (NEPRS) current.

Some of the pertinent input required for these activities comes from the system proponent through the TSM/AO. The TSM/AO will consult with the Soldier Support Center concerning the preparation of the IRTP.

Appendix E of TRADOC Regulation 600-4 provides the procedures for preparing the IRTP input concurrently with preparing the AP. Further information can be gained from a study of NEPRS.

EVENT B26--ASARC II/DSARC II/IPR

OVERVIEW

Purpose

The general purpose of the ASARC/DSARC/IPR review procedure is described under Event A12 (p. III-216). The specific purpose of the Milestone II review is to determine whether the demonstration and validation activity has been completed and a need for the system still exists. If the results of the reviews are positive, the Secretary of Defense will reaffirm the mission need and approve selection of the system for full-scale engineering development, including procurement of long-lead production items and limited production for operational test and evaluation, as set forth in DODD 5000.1.

Relation to Other LCSMM/IPS Events

The review procedure is based on the information provided in the Acquisition Plan, Event B24, which incorporates the ROC or LR as required and the Independent Evaluation Report of OT/DT I. It is Event 42 of the LCSMM.

TSM/AO Responsibilities

The TRADOC representative will be a member of an ad hoc working group formed about 11 months before the scheduled ASARC. This group will determine the training and personnel issues to be included. The TSM/AO must insure that the issues determined by the system proponent in the areas of logistics, personnel, and training are disseminated to the appropriate agencies for resolution. He will be called upon to brief the first five items of the agenda listed in Event A12 at ASARC II.

Phasing

Approximately 4 to 6 months before a scheduled SECDEF decision for a major system, the DSARC will initiate action to request a milestone meeting.

Approximately 11 months before the ASARC meeting, the ad hoc working group will prepare the ASARC agenda. See Event A12.

INPUT DATA/EVENT DATA BASE

Output of Event B24.

OUTPUTS AND END PRODUCTS

- a. ASARC/DSARC/IPR Decision. A SECDEF/DA proponent decision to continue to the Full-Scale Engineering Development Phase. Approval leads to a contract award for system development.
- b. Critical Issues. Identification of remaining personnel and training issues to be resolved and recommendations for the method and timing of their resolution. These become issues for personnel studies, in accordance with AR 70-8, and for inclusions in OT II and subsequent COEA and CTEA.

REFERENCES

DODD 5000.1, Major System Acquisition

DODD 5000.2, Major System Acquisition Process

DODD 5000.26, Defense Systems Acquisition Review Council (DSARC)

AR 15-14, Systems Acquisition Review Council Procedures

EXAMPLES AND ILLUSTRATIONS

The checklist for Milestone II (Appendix B, AR 15-14) is reproduced in Figure IV-9.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT B26

Guidance for preparing for the review procedures for Milestone II is provided in DODD 5000.1, DODD 5000.2, and AR 15-14, Appendix B (included herein).

The basic elements the system proponent must address are:

- a. Impact on MOS structure and individual training.
- b. Use of simulators for individual and unit training.
- c. Steps to minimize maintenance and support personnel.

d. Plan for Integrated Logistic Support (ILS).

e. Validity of cost estimates, including COEA costs.

These issues should have been thoroughly covered in the TBOIP, TQQPRI, and ICTP.

The issues remaining unresolved will be stated in the AP with recommendations on the method and timing of their resolution.

At the ASARC/DSARC/IPR reviews, a decision will be made as to whether any of these issues are critical enough to delay continuation of development. If not, it will be recommended to the Secretary of Defense or other approving authority that the system enter the Full-Scale Engineering Development Phase. This recommendation is made in the form of a Decision Coordinating Paper (DCP) of no more than 20 pages.

CHECKLIST FOR MILESTONE II REVIEWS

(END DEMONSTRATION AND VALIDATION PHASE:

BEGIN FULL-SCALE ENGINEERING DEVELOPMENT PHASE)

The following items will be reviewed at Milestone II:

- a. Need. The mission element task is reaffirmed to be essential.
- b. Threat. The updated threat is credible, addresses the correct time-frame, and has been validated by CG, INSCOM, in coordination with ACSI and, when appropriate, by DIA.
- c. Recommended System/Program Alternative.
 - (1) Satisfies the mission element need(s).
 - (2) Is cost-effective.
 - (3) Is within established constraints.
 - (4) Is supported by results of demonstration and validation.
 - (5) Considered foreign and other service alternatives.
 - (6) Provides for service and NATO standardization and interoperability.
 - (7) Takes into account joint service implications.
 - (8) Takes into account environmental considerations (DODD 6050.1).
 - (9) Systems tradeoff has produced the most effective balance between costs, performance, and schedule, including operational and logistical consideration.
 - (10) Establishes nuclear survivability criteria.
- d. Operational Factors.
 - (1) Ensures electromagnetic compatibility and frequency supportability.
 - (2) Identifies electronic/infrared/optical counter-countermeasure performance requirements (DODD 4600.3).
 - (3) Provides adequate force structure plan and schedule for phase in, AAO, and distribution plan.
 - (4) Addresses impact on Reserve Components.
 - (5) Addresses impact on MOS structure and individual training.
 - (6) Includes use of simulators for individual and unit training.

Page 1 of 3

(7) Establishes performance goals and thresholds.

(8) Recommends disposition of current family or series of equipment being replaced or phased out.

e. Logistical Factors.

(1) Minimize O&S costs.

(2) Minimize maintenance and support personnel.

(3) Establish RAM goals and thresholds.

(4) Plan ILS.

f. Cost.

(1) Establishes validity of cost estimates, including COEA costs.

(2) Establishes realistic design-to-cost (DTC) goals and thresholds for:

(a) Hardware design-to-cost.

(b) O&S costs.

(3) Program cost thresholds and fiscal year thresholds.

g. Acquisition Strategy. Has been updated, effectively supports achievement of program objectives, and is being executed in the conduct of program management.

(1) Short- and long-term business planning supports the strategy.

(2) Contract types are consistent with the program characteristics, risks, uncertainty, and strategy.

(3) Producibility and production risk considered.

(4) Planning for selection of major subsystems is clearly stated, maximizes sustained competition, and accepts the use of existing military and commercial equipment as appropriate.

(5) Requirements established for:

(a) Long-lead procurement items.

(b) Initial limited production to support OT&E needs.

(c) Verification of production engineering and design maturity.

(d) Establishing the production base.

- h. Schedule. Goals and thresholds established.
- i. Risk.
 - (1) Uncertainties and risks identified and acceptable.
 - (2) Adequate plans to resolve remaining uncertainties and risks.
- j. Testing.
 - (1) Results of DT/OT I support recommendations.
 - (2) Adequacy of testing, critical issues remaining to be resolved by testing, quality of test efforts, validity of test results, and plan for further testing.
 - (3) Update of Coordinated Test Program (CTP).
- k. Program Management.
 - (1) Structure.
 - (2) SAR initiated (DODI 7000.3).
- l. TJAG Legal Review. Consistent with international law.

SECTION V

IPS MODEL:

FULL-SCALE ENGINEERING DEVELOPMENT (FSED) PHASE

Overview

During the Full-Scale Engineering Development (FSED) Phase of the LCSMM, an advanced prototype of the materiel is developed and tested, deficiencies identified, and corrective solutions developed. The overall goal of the phase is to demonstrate (a) the technical feasibility of developing the material, and (b) the military usefulness of the materiel.

At the end of the FSED Phase, the evidence should be clear as to whether (a) full-scale production of the materiel and its support system is warranted or (b) further development and testing is needed.

Scope

During this phase the complete logistic support package for the materiel is developed and tested. This package includes programs for new equipment training and for individual and collective training. Training devices, training ammunition and ranges, training administrative procedures, and so on also are developed, validated, and revised.

Human factors considerations such as selection criteria, MOS and skill level requirements, and aptitude/experiential/physical/attitudinal requirements are assessed in Operational Test II and related activities, and revised to reflect the findings.

Major training activities during this phase include:

- o Awarding training development/production contract.
- o Developing training materials and devices.

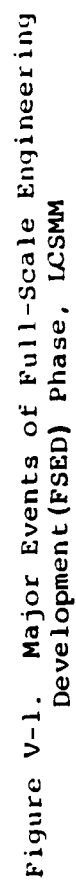
- o Developing and starting new equipment training.
- o Validating training programs and material, to include Skill Performance Aids (SPAs) material.
- o Developing/incorporating training inputs into requirements documents.

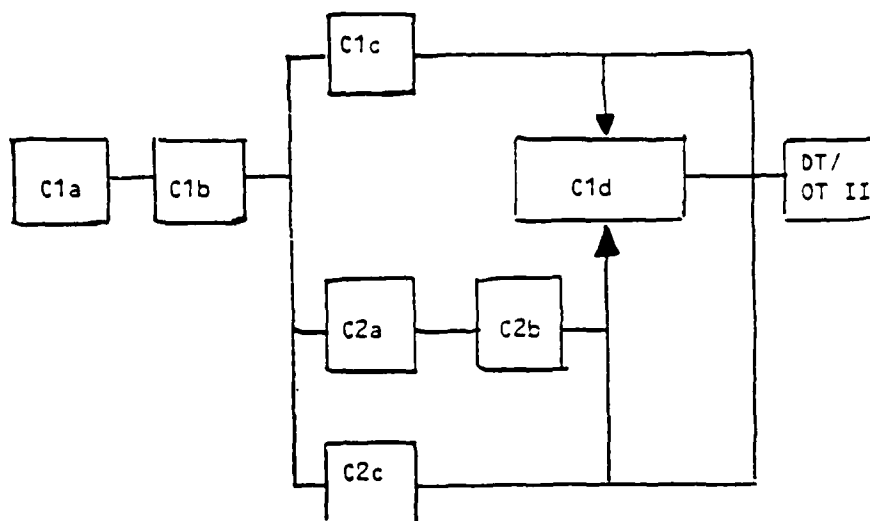
The flow chart for the major events in this phase is shown in Figure V-1 and in the Chart for Phase III in the back of this handbook (based on Figure 3, TRADOC Regulation 600-4). In this chart, two major events--C1 and C2--are shown as occurring before DT/OT II.

Event C1 (Input for DT/OT II) encompasses so many important activities that it will be subdivided into its major elements for separate discussion in this handbook. These elements include: Event C1a, development and award of a production contract for both materiel and training; Event C1b, preparation of revised/updated TASA data and ICTP; Event C1c, development of training programs and devices; and Event C1d, preparation of DT/OT II evaluation plans. They are comparable to IPS Events B1 through B5 of the Validation Phase of the LCSMM.

Also prior to DT/OT II, in Event C2, (New Equipment Training) SPA material must be prepared and new equipment training programs developed. These activities are the responsibility of the materiel developer and usually are accomplished by the contractor. These activities also will be discussed separately, under Events C2a, and C2b. Acquisition of training devices will be discussed separately, in Event C2c. The relationship between C1 and C2 activities is shown in Figure V-2.

It should be noted that there is a numbering discrepancy between the text and the diagrams of TRADOC Regulation 600-4, caused by separating the discussions of DT II and OT II. In this handbook the numbering system used in the text is the same as used in Figure V-2. The flow chart diagram for Phase III follows the numbering used in Figure 3 of TRADOC Regulation 600-4.





C1 - Input for DT/OT II

- C1a - Preparation/Award of FSED Contract
- C1b - TASA/ICTP Update
- C1c - Development of Training Material/Programs
- C1d - Preparation of DT/OT II Test and Evaluation Procedures

C2 - New Equipment Training

- C2a - Development of SPA Material
- C2b - Development of New Equipment Training
- C2c - Acquisition of Training Devices

Figure V-2. Events C1 and C2 of IPS

Discussion of Events

EVENT C1a--PREPARATION AND AWARD OF FSED CONTRACT

OVERVIEW

Purpose

The purpose of this event is to insure that the contract provides for responsive answers to the personnel and training issues identified in the Acquisition Plan (AP) (Event B24).

Relation to Other LCSMM/IPS Events

In the LCSMM this event is incorporated in planning for OT II. Contract award is Event 45 in the LCSMM but preparation of the issues to be included was accomplished in Event 41 of the LCSMM.

TSM/AO Responsibilities

The awarding of the FSED contract is the responsibility of the materiel developer. The TSM/AO will ensure that the latest available information in training and personnel issues determined during Event B24 (Acquisition Plan) is included and that access to data needed during contract performance is provided.

Phasing

As soon as possible after ASARC II/DSARC II/IPR decision(s).

INPUT DATA/EVENT DATA BASE

- a. Acquisition Plan (Event B24, page V-97).
- b. Updated studies--Personnel Studies, CTEA/COEA, Evaluation Reports.

OUTPUT AND END PRODUCTS

Responsive contract and selected contractor.

REFERENCES

AR 715-6, Proposal Evaluation and Source Selection

ARI TR-78-A7, TSN Guide to Training Development and Acquisition for Major Systems

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C1a

Although the input information is more detailed, because of experience in OT I and evaluations of its results, the contract for FSED Phase is much like that for the DVAL Phase. The objectives are more fully defined but the procedures are similar to those in Event B1 (page IV-4). The points to emphasize are those discussed for the AP, Event B24, to ensure the incorporation of the latest available information.

EVENT C1b--TASA/ICTP UPDATE

OVERVIEW

Purpose

During this event the Task and Skill Analysis (TASA) data developed during the DVAL Phase are updated, final selection is made of those tasks to be covered by the training programs, and the Individual and Collective Training Plan is updated.

Relation to Other LCSMM/IPS Events

The outputs of Event C1b provide the data base for all training-related activities prior to the DT/OT II (Events C3 and C4).

TSM/AO Responsibilities

The TASA data are provided by the contractor. The TSM/AO will assure that these data are forwarded to the training proponent and the combat developer. The training developer will update the ICTP. The TSM/AO functions as a coordinator of these activities.

Phasing

The event should be completed 24 months before the scheduled date for DT II.

INPUT DATA/EVENT DATA BASE

- a. Task and Skill Analysis (TASA) data. These data are during Event B2 and updated during Event B19.
- b. ICTP (from Event B17).
- c. FSED Contract (from Event C1a).

OUTPUTS AND END PRODUCTS

Revised and updated TASA data. These data are used to prepare all training programs and material, develop plans for evaluating training programs/material,

revise personnel requirements as necessary, verify training device requirements, and provide an overall plan for the development of the training support system. These data should be available about 18 months before DT II.

REFERENCES

AR 700-127, Integrated Logistic Support
DARCOM Supplement #1 to AR 700-127, Integrated Logistic Support
TRADOC Regulation 351-4, Job and Task Analysis
TRADOC Circular 351-4, Job and Task Analysis
TRADOC Circular 351-8, Individual and Collective Training Plans

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C1b

During the early stages of the FSED contract the contractor will begin the development of Skill Performance Aids (SPAs) material (preparation of this material is discussed under Event C2a). The initial step is the revision and update of the TASA or Front-End Analysis (FEA) performed during the DVAL Phase (see Event B2).

This FEA consists of the following:

- a. An equipment analysis that identifies all tasks associated with the equipment.
- b. A functional analysis that identifies symptoms for faults that require troubleshooting and describes mission functions and operation of associated equipment systems.
- c. A task analysis that develops data for use in preparing technical manuals and supporting training material.

On the basis of these analyses, tasks that will be covered in operator and maintenance manuals are identified. For each task selected, a behavioral analysis is conducted and various data are generated. The procedures for accomplishing these activities have been discussed under Event B2 (page IV-9). Guidance is provided in the DARCOM/TRADOC Technical Documentation and Training Acquisition Handbook.

The foregoing activities should be familiar to the contractor. In most instances the contractor for the FSED Phase will be selected from those competing during the DVAL Phase of the LCSIM. Therefore, the contractor already will have prepared TASA data for his versions of the materiel system. Event C1b activities involve updating these data on the basis of an advanced version of the materiel analyzed during the DVAL Phase.

During the DVAL Phase the contractor also was probably involved in developing and revising the ICTP. During this event (C1b) the ICTP prepared during the DVAL Phase must be updated to reflect the latest TASA data.

The updated TASA and the updated ICTP will undergo proponent review, first by the training developer and then jointly by the training and materiel developers. During the joint review, agreement will be reached regarding which tasks will be covered by SPA material and which will be covered in other portions of the training system.

For the revised ICTP the reviewers must agree on (a) those portions of the training support package to be prepared by the training and the materiel developers, respectively; (b) the need for and the general procedures for acquiring training devices; and (c) the role of the combat developer in preparing or assisting in the preparation of collective training programs and draft Army Training and Evaluation Programs (ARTEPs).

The contractor will identify individual operator and maintenance task requirements and those collective tasks performed by two or more operator/maintenance personnel. The combat developer, as an in-house effort, will develop/update the inventory of collective tasks and assure that data pertaining to these tasks, especially crew performance standards, have been updated in accordance with the latest concept of equipment employment and organizational structure.

EVENT C1c--DEVELOPMENT OF TRAINING SUPPORT PACKAGE (TSP)

OVERVIEW

Purpose

During OT II the complete Training Support Package must be evaluated. Portions of this package were prepared for OT I, and the remainder of the package is now developed in draft form. Event C1c describes portions of the total training package prepared by the trainer/combat developer. Those portions prepared by the materiel developer are discussed under Events C2a through C2c.

Relation to Other LCSMM/IPS Events

Event C1c is part of the activities subsumed under Event C1 of the IPS model and Event 46 of the LCSMM model.

TSM/AO Responsibilities

Portions of the total Training Support Package are the responsibility of the training developer and the materiel developer. The TSM/AO is responsible for coordinating these activities to assure that all training requirements are covered, duplications are avoided, and the Extension Training Material (ETM) developed by the materiel developer is used whenever possible by the training developer. The TSM/AO also assures that all collective training requirements/material are passed on to the materiel developer so that they can be incorporated into New Equipment Training (NET) courses. The TSM/AO will assure that production schedules are established and adhered to. He also will monitor the development and validation of training material. TSM/AO staffing coordination requirements are shown in Figure V-3.

Phasing

This event starts immediately after Event C1b is completed. That event should terminate with an agreement between the materiel and training developers

FULL-SCALE ENGINEERING DEVELOPMENT (FSED) PHASE

TRAINING ACTIVITIES	DCSCD	DCST	TSM	PROPOONENT SCHOOL	DARCOM	ADMINCEN	LOGCEN	LOGCEN SCHOOL	ATSC
Outline Test Plan, OT II	R/C		R	P/I*	I	R	R/I	I	R
Independent Evaluation Plan	R/C		R	P/I*		R	R	I	R/I
FQQPFI	R/C	R	R	I	P	R	R/I/IC	I	R
BOIP	R/C	R	R	P	I	R	R/I/IC	I	R
Final Draft ITDT Products	R		R	I	P/C		R/I	I	R
NETP/IKP	R/I		R	I	P	R	R/I	I	R/I/C
DT/OT II**									
ICTP Implementation (Draft SN; ANTEP Update; SQT; TEC; Institutional Courses; Training Devices; ACCP)	R		R	P	I		R/I/IC	I	R/I/C
ITP Input		R	R	P			R	I	R

P = Primary Proponency
 R = Review Within Mission Area
 I = Input
 C = Coordinate as Matter of Mission
 IC = Internal Coordination
 A = TRADOC Approval Authority

Figure V-3. Training Activity Responsibilities and Coordination Requirements (From Appendix B, TRADOC Circular 351-8)

as the elements of the training support package each is to develop. Event C1c activities must be completed about 6 months prior to OT II.

INPUT DATA/EVENT DATA BASE

The updated TASA data and ICTP developed during Event C1b; also, training requirements as described in the Acquisition Plan and the FSED contract. Recommendations for training contained in the evaluation report for OT I also may provide useful inputs.

OUTPUTS AND END PRODUCTS

A variety of training programs/courses/packages/training literature as described in preceding text; see also descriptions in TRADOC Circular 351-8. Outlines of training programs/courses are used to prepare training portions of the Test Design Plan for OT II. Detailed training Programs of Instruction/material/tests must be available 6 months prior to OT II so they can be used to prepare the training portion of Test Design Plan. Programs/courses are used to train instructors for OT II; the instructors in turn use material to train OT II participants. Refined versions of programs/courses/material become the training support system for the developing materiel. The products of this event must be available, in outline form, 12 months before OT II; in detailed form, 6 months before OT II.

REFERENCES

- AR 71-5, Introduction of New or Modified Systems/Equipment (to be replaced by AR 350-XXX)
- OTEA, Operational Test and Evaluation Handbook
- TRADOC Circular 70-1, Training Device Development
- TRADOC Circular 350-3, Individual/Collective Training and Development Glossary
- TRADOC Circular 351-3, Individual Training Plan
- TRADOC Circular 351-4, Job and Task Analysis

TRADOC Circular 351-5, SQT Policy and Procedures

TRADOC Circular 351-8, Individual and Collective Training Plans for
Developing Systems: Policies and Procedures

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C1c

The Training Support Package is part of the Test Support Package, preparation of which was discussed under Event B4 (page IV-17).

Early in the Development and Validation Phase of the LCSMM, the system proponent and materiel developers reach agreement on those elements of the total training package to be prepared by each. Essentially, the materiel developer prepares technical manuals, SPA materials, and new equipment training courses, and oversees the development of training devices. The trainer/combat developers prepare all other components of the total training package. The materiel developer and training/combat developers will use the TASA data and updated ICTP produced during Event C1b as the basis for their respective training programs.

The training developer is primarily concerned with preparing individual training programs for new MOS specialties or inputs to existing appropriate individual training programs. In particular, the training developer is responsible for training related to common tasks (e.g., tasks performed over a variety of equipments) and tasks associated with "generic skills" (e.g., use of test equipment). The training developer also prepares training material covering individual tactical training requirements.

The combat developer is responsible for the preparation of collective training material. This includes the preparation/revision of field manuals, "how to fight" manuals, and training circulars. The combat developer also is responsible for the preparation of Army Training and Evaluation Programs (ARTEPs). The appropriate draft ARTEPs must be available for OT II.

TRADOC Circular 351-8 describes the major training products that must be prepared for OT II. The OTEA Operational Test and Evaluation Methodology Guide is specific as to when these products must be available in outline form (12 months before OT II) and in detailed form (2 weeks prior to training).

Descriptions of the products developed by the training proponent follow.

- a. Institutional Training Courses. These courses are seldom needed before OT II. However, their POIs must be available before OT II because they are used to conduct NET courses for OT II participants. As appropriate, these courses will include training for individual and collective tactical tasks. For OT II, collective training for units/crews is most likely to be provided by an initial NET team. The POI and training material used by this team must be approved by the training proponent.
- b. Army Correspondence Course Program (ACCP). The tasks or jobs to be included in correspondence courses will be identified in the ICTP. The POI for these courses must be developed prior to OT II. If non-resident instruction is designated as a prominent part of the training of system personnel, then draft ACCP lesson material must be ready for evaluation during OT II.
- c. Army Training Literature Program. Field manuals, "how to fight" manuals, training circulars, and similar publications are prepared as part of this program. Field and "how to fight" manuals are used to teach both individual and collective tactical tasks. Draft versions of these manuals must be prepared prior to OT II.
- d. Soldier's Manuals (SM) and Job Training Books (JTB). Soldier's Manuals and Job Training Books are developed by the materiel developer as part of the Extension Training Material for the SPAs. For OT II, SMs and JTBS do not need to exist as such. However, SPA/ETM material developed for and evaluated during OT II eventually is repackaged to become SMs and JTBS.

The SMs will contain a listing of high-risk tasks for each MOS along with standards of performance, references and training material, and related information. This information is derived from the TASA data developed by the contractor. The JTBS contain ETM first prepared by the contractor in support of technical manuals. The tests developed to assess the effectiveness of ETM eventually become the Skill Qualification Tests for the tasks in the Soldier's Manuals.

- e. Training Extension Courses (TEC). The Soldier's Manuals/Commander's Manuals/SQT approach to training is designed to provide an integrated training package structured around a soldier's job. An extension training course is similar to a course prepared for institutional training and is structured around an MOS or a duty position. When the ICTP indicates that extension training courses will be used, a draft POI and lesson material for these courses must be available for OT II.

f. Collective Training (CT) and Army Training and Evaluation Program (ARTEP). In preparation for OT I, high-risk collective tasks were identified and draft Field Manuals (FMs) and "how to fight" manuals were prepared. In preparation for OT II, collective training requirements and training materials must be expanded and refined. This will be accomplished during the process of updating the ICTP (Event C1b). The updated ICTP will contain an expanded/revised collective training concept for both institutional and unit training, to include training for trainers and training managers. (Instructor and Key Personnel course) and training for opposition force units, battle simulation, and command staff units. The detailed package prepared for OT II (and IOC) must include updated/revised FMs and "how to fight" manuals. As part of TEC development, a draft ARTEP will be prepared by the combat developer.

TRADOC Circular 351-8 outlines the procedures for establishing schedules and development milestones for each of the products just described. Preparation of these schedules involves backward planning for each product. TRADOC Circular 351-8 also lists many of the references that provide guidance for preparing components of a Training Support Package. Guidance regarding the preparation of lesson material and training courses for individuals is quite well developed, but similar guidance for collective training exists only in rudimentary form.

Preparing the Training Support Package often involves acquiring sophisticated training devices, especially maintenance simulators. Acquisition of such devices is discussed under Event C2c.

EVENT C1d--TEST AND EVALUATION PLANS/PROCEDURES FOR DT/OT II

OVERVIEW

Purpose

The purpose of Event C1d is to develop plans for evaluating DT/OT II test issues. The event begins with the preparation of a rather general Independent Evaluation Plan and terminates with the preparation of a Test Design Plan for controlling the DT/OT and collecting and processing test data.

Relation to Other LCSMM/IPS Events

This event is part of Event C1 of the IPS model and Event 46 of the LCSMM model. DT/OT II cannot be conducted until Event C1d has been accomplished.

TSM/AO Responsibilities

The TSM/AO coordinates the preparation of the DT/OT inputs developed by the combat developer, the training developer, LOGCEN, SSC, and other TRADOC agencies as appropriate. (See Figure V-3, page V-11).

Phasing

This event begins about 2 years before DT/OT II and must be completed before the Planning Year for the Army Budget so resources can be programmed via TRADOC/OTEA Test Budget and Five Year Test Program.

INPUT DATA/EVENT DATA BASE

Test issues and evaluation guidance located in the Acquisition Plan; test issues and test plans prepared by the materiel developer, combat developer, training developer, logistician, and other appropriate agencies; issues developed for further test following OT I (see Event B8, page IV-39). As the plans become more detailed, inputs include the outline of training programs and draft POIs and eventually include detailed lesson and testing material. Outlines of training courses should be available about 12 months before OT II.

OUTPUTS AND END PRODUCTS

A detailed set of plans for conducting DT/OT II, including the sequence of events, control procedures, data collecting procedures, and data analysis procedures. See description for Event B4 (page IV-17). These plans are used to control the conduct and data analysis for DT/OT II. They must be available by the scheduled time for training all the various participants for DT/OT II.

REFERENCES

AR 70-10, Test and Evaluation During Development and Acquisition of Materiel

AR 71-3, User Testing

OTEA, Operational Test and Evaluation Handbook

ARI TR-78-A7, TSM Guide to Training Development and Acquisition of Major Systems

Mitre Corporation, A Guide for TRADOC System Managers

EXAMPLES AND ILLUSTRATIONS

A sample test objective statement from the OTEA Operational Test and Evaluation Handbook (Objective 3, Figure 4.2) is reproduced as Figure V-5.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C1d

The development of test evaluation plans and procedures has been discussed under Event B4 (page IV-17). DT II includes an assessment of whether the draft training material is ready to enter the production phase. Also assessed are the human engineering aspects of the materiel and associated aspects of training devices. OT II provides for evaluating the materiel in terms of its effectiveness and military worth, and its total logistic support package, including all training support material.

The process of preparing for a DT/OT involves the preparation of four documents, as depicted in Figure V-4. These documents are an Independent Evaluation

Plan (IEP), an Outline Test Plan (OTP), a Test Design Plan (TDP), and a detailed Test Plan (TDP). These plans are based on the identification of critical test issues. For major systems these issues are identified by a task force or by a study/advisory group. For non-major systems, critical issues for testing are identified by COEA study group, the combat developer, the training developer, and other agencies as appropriate. Issues that should be evaluated during OT II include (a) those that could not be evaluated or resolved during OT I, (b) those related to the effectiveness of collective training material, and (c) those related to training device effectiveness.

The training proponent will develop training issues for the OT. The designated tester will determine which of these issues can be subjected to test and will develop a list of test parameters. The training proponent then will prepare test criteria, especially the standards that should be met during the test. Figure V-5 is a sample of a Test Objective statement.

The training proponent prepares or assists in preparing the IEP and the OTP. For OT II the test plan must require that pre-OT group training be assessed. This training will be conducted by military instructors and data will be collected to assess its effectiveness.

OBJECTIVE 3: Training. To assess the adequacy of the training program and proposed personnel selection criteria.

SUBOBJECTIVE 3.1: To provide training data.

MEASURES: 3.1.1 - Distribution of student test scores (GT, hearing, sight, A/C recognition test, system proficiency test - after initial training and at end of OT).

3.1.2 - Proportion of persons requiring additional instruction.

3.1.3 - Summary of students' recommended changes to training POI.

3.1.4 - Summary of instructor's identification of main problem areas in training.

3.1.5 - Plot of learning curve. (Reaction time under systematically controlled conditions.)

SUBOBJECTIVE 3.2: To provide personnel selection data.

MEASURES: 3.2.1 - Distribution of student test scores (GT, hearing, sight).

3.2.2 - Distribution of student personnel data (TIS, age, formal education, military schooling, MOS, time in that MOS, time in current organization, expressed job interest).

3.2.3 - Porportion of personnel failing to complete training.

3.2.4 - Observed reasons for failure to complete training.

3.2.5 - Consensus of key personnel concerning any attributes distinguishing highly proficient ZAP personnel from less proficient personnel.

Figure V-5. Sample of Test Objective Statement

EVENT C2a--DEVELOPMENT OF SPAs MATERIAL

OVERVIEW

Purpose

The purpose of this event is to develop operator and maintenance manuals. In support of these manuals, Extension Training Material (ETM) is developed for tasks that cannot be fully described in the manuals.

Relation to Other LCSMM/IPS Events

This event is a continuation of Event C1a.

TSM/AO Responsibilities

SPAs material is developed by the materiel developer, usually under contract. The TSM/AO has joint responsibility for monitoring these developmental activities.

Phasing

SPAs material must be ready prior to the scheduled date for training OT II player personnel.

INPUT DATA/EVENT DATA BASE

Updated TASA data and ICTP developed/revised during Event C1b.

OUTPUTS AND END PRODUCTS

A series of technical manuals and associated ETM, for all operator and maintenance positions required of the developing system. The SPAs material is used to train personnel for OT II. The material is incorporated into New Equipment Training programs and may be used in institution training programs. SPAs material will be available prior to OT II training, preferably when draft NET and institutional courses for OT II are being prepared.

REFERENCES

AR 700-127, Integrated Logistic Support

DARCOM Supplement #1 to AR 700-127, Integrated Logistic Support

TRADOC Regulation 351-4, Job and Task Analysis

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

TRADOC Pamphlet 351-4, Job and Task Analysis Handbook

DARCOM/TRADOC Handbook, Technical Documentation and Training Acquisition

MIL-STD 1388-1, Logistic Support Analysis

MIL-M-63035, Front-End Analysis

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C2a

The SPAs development process is "directed towards developing an integrated package of technical documentation and training which provides the soldier with the exact information and skills--and only those--needed for on the job performance." The SPAs package consists of (a) technical documentation that provides the soldier with all the information he needs for on-the-job performance of those tasks, and (b) ETM designed to teach and develop proficiency in task performance and in the use of technical documentation.

The development of SPAs material has been extensively described in DARCOM/TRADOC publications referenced at the end of this section. The process begins with a Front-End Analysis (FEA) performed in consonance with logistic analysis requirements as described in MIL-STD 1388-1. The new materiel is first subjected to an equipment analysis which identifies all operator and maintenance tasks. For each task a functional analysis is performed to define equipment operations in terms of functional operations and data flow. Each task then is further analyzed to identify skill, informational, and training requirements, job performance standards, and so on.

This process is the same as that described for Event B2 (Contractor-Prepared TASA, page IV-9) and the result is an extensive inventory of tasks for all

operator and maintenance positions. It is assumed that each of these tasks will be described in either operator or maintenance technical manuals. In preparation for inclusion of tasks in these manuals, a behavioral analysis is performed on each task to develop more detailed information about task performance conditions, initiating cues, performance standards, and so on.

The task inventory is analyzed further to identify tasks in need of support by training material. For each of these tasks training objectives are established, criterion tests are developed, the most appropriate training methods and presentation methods are selected, and an associated set of task-oriented training materials are developed and verified. All of these activities occur during the DVAL phase for high-risk tasks. However, when feasible they should be accomplished on a preliminary basis during the Concept Phase (see Event A3, this handbook).

SPAs materials are developed by the materiel contractor. It can be assumed that, for developing systems, much of the analytic activities just described were accomplished during the FSED Phase, especially during Event B2. In Event C1b the TASA data are updated, as is the ICTP developed during Phase II.

Contractor FEA activities provide a task list for each level of maintenance and operator logistical support requirements. To complete this activity a list of collective and tactical tasks must be developed by the combat developer. Strictly speaking, this aspect of the analysis effort is not part of the SPAs effort. However, it is imperative that the output of the SPAs FEA be integrated with the task inventory provided by the combat developer, so that both the materiel and the training developers will have a complete system task list on which to base their respective training programs. This list of tasks and its

associated data provide the basis for formulation of institutional and unit training programs by the training developer, and new equipment training programs by the materiel developer.

The next major step in the SPAs process is preparation of operator and maintenance technical manuals. Before OT I the materiel developer contractor provides a "synoptic outline" of each TM to be produced, along with preliminary documentation and storyboard training material for high-risk tasks. This material, mostly training material for high-risk tasks, undergoes initial validation during OT I. In preparation for OT II this material is updated and new material generated for lower risk tasks. After major blocks of technical material are developed, they must be validated by contractor personnel.

While technical manuals are being developed, extension training material to support selected tasks also is being developed. This ETM material, which is primarily self-instructional, provides training on those tasks difficult to fully describe in the TMs. In addition, the ETM material may provide instruction directed toward acquiring proficiency in the use of the TMs. In addition, the ETM material may provide instruction directed toward acquiring proficiency in the use of the TMs.

EVENT C2b--NEW EQUIPMENT TRAINING (NET) FOR DT/OT II

OVERVIEW

Purpose

During OT II the Training Support Package must be assessed. The key issues concerned whether the training material is effective, and cover the correct group of tasks for each operator and maintenance position. New Equipment Training provides a means for testing the training support package and for preparing DT/OT II player personnel.

Relation to Other LCSMM/IPS Events

Event C2b is part of Event 50 of the LCSMM, and a continuation of Event C2a.

TSM/AO Responsibilities

The NET package will be developed by the materiel developer. The training proponent/TSM/AO are responsible for obtaining instructor personnel for training during NET. Also, the TSM/AO will assure that NET includes collective task training as developed by the combat developer. Both the materiel and the training developers prepare elements of the training support package for OT II. The TSM/AO will assure that this development is conducted and that the two training packages are mutually supporting and collectively cover all training requirements.

Phasing

Follows Event C2a.

INPUT DATA/EVENT DATA BASE

Updated TASA data and updated ICTP from Event C1b.

OUTPUTS AND END PRODUCTS

An Instructor and Key Personnel (I & KP) course for teaching military personnel how to train system operators and maintenance personnel, using trial

POI and draft technical manuals, ETM, training aids and devices, and other materials (simulated targets, etc.) which have been developed for operator or maintenance training. The I & KP course is used to train military instructors who in turn will use components of the course to train OT II players.

Eventually, much of I & KP course material will be incorporated into institutional courses or into New Equipment Training courses. The training strategy/concept and task list are required inputs to the preparation of a Test Design Plan by the designated operational tester. The POI manuals will be available in outline form 18 months before OT II, and in detailed form 2 weeks prior to the start of training.

REFERENCES

AR 71-5, Introduction of New or Modified Systems/Equipment

TRADOC Circular 70-1, Training Device Development

TRADOC Circular 350-3, Individual/Collective Training and Development
Glossary

TRADOC Circular 350-XXX, Collective Training Plan

TRADOC Circular 351-3, Individual Training Plan

TRADOC Circular 351-4, Job and Task Analysis

TRADOC Circular 351-5, SQT Policy and Procedures

TRADOC Circular 351-8, Individual and Collective Training Plans for
Developing Systems: Policies and Procedures

ARI TR-78-A7, TSM Guide to Training Development and Acquisition of Major
Systems

Reference Letter, ATTSC-DS-DPA, 6 February 1979, Standard Training
Paragraphs for Requirements Documents and Operational Test Training
Issues

Navy Training and Evaluation Group, A Technique for Choosing Cost-Effective
Instructional Delivery Systems, TAEG NO. 16

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C2b

This event is a continuation of Event C2a, during which technical manuals are prepared and ETM is prepared in support of selected tasks described in the manuals. During Event C2b SPAs material is combined with additional training material into draft training courses. These courses are MOS oriented and cover, for each operator and maintenance position, the individual and collective tasks that must be mastered by job incumbents.

Early in this event a list of collective tasks that must be learned by individuals and by units is obtained from the combat developer. These tasks, combined with a list of individual tasks for each MOS, then are used to prepare a trial POI for each MOS. The training developer must approve this trial POI since it will become the basis for institutional courses, as well as for NET courses. The POI outlines the integration of all training devices, aids, and lesson material developed both by the materiel developer (SPA material) and by the training developer (FMs, lesson material on common tasks, etc.).

In preparation for OT II, military instructors will be trained. These persons then will conduct training for OT II player personnel. To accomplish this the materiel developer must develop Instruction and Key Personnel (I & KP) course(s).

The development of instructional material for I & KP/NET training must include tests for assessing both individual and collective training. In addition to SPA test material, ARTEPs will be prepared for assessing collective training. ARTEP development is the responsibility of the combat developer.

Instructional elements of NET courses must be validated before they are used in preparing for OT II. Validation procedures are included in documents and Military Standards that describe the development of SPAs material.

SQT tests and associated training material (Job Training Packages) will be available in draft form for OT II. Job Training Packages consist of training material plus guidance material for the trainer/supervisor. The packages are prepared by the training developer and used to assist individuals or units conducting training away from the TRADOC institutional setting. The training is directed at obtaining proficiency on tasks listed in the Soldier's Manual for a particular MOS. Job Training Packages and related SQTs must be available in draft form for evaluation during player training for OT II.

EVENT C2c--TRAINING DEVICE ACQUISITION

OVERVIEW

Purpose

During this event a prototype training device(s) is acquired.

Relation to Other LCSMM/IPS Events

This event is part of LCSMM Event 50 and IPS Event C2.

TSM/AO Responsibilities

The training device is acquired by the materiel developer. However, the training developer is responsible for preparing the functional specifications for the device and for evaluating it (Training Device DT/OT) as a part of OT II player training. The TSM/AO coordinates the interactions between the training and materiel developers, and coordinates delivery of the device(s) to TRADOC, and so on.

Phasing

The training device(s) must be available about 12 months prior to OT II. This requirement may be difficult to meet and portions of the DT/OT for the device may have to be conducted at contractor facilities. A product-oriented planning schedule for training devices is contained in TRADOC Circular 351-8, Appendix D.

INPUT DATA/EVENT DATA BASE

Training device requirements will be described in a number of documents, including the LOA, the Acquisition Plan, and the FSED contract. In addition, the TRADOC evaluation report for OT I may contain comments on training device requirements, especially if a brassboard version of the device was evaluated during OT I. The updated ICTP (Event C1b) will describe any requirements that are more recent than those contained in the system Acquisition Plan (Event B24).

Of the documents cited, the ICTP update is the last to be prepared and it should be available about 6 months following award of SFED contract.

OUTPUTS AND END PRODUCTS

A prototype training device, to include the test support package for the device. It is used to train personnel for OT II. The prototype must be available for the scheduled DT of the training device.

REFERENCES

TRADOC Circular 70-1, Training Device Development

TRADOC Circular 351-8, Individual and Collective Training Plan for
Developing Systems: Policy and Procedures

DARCOM-TRADOC, Technical Documentation and Training Acquisition Handbook

USATSC, Training Development Study: A Guide to Training Effectiveness
Analysis for Training Devices

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C2c

The process by which training device requirements are developed has been described under Event B18 (page IV-78). To summarize, training device requirements are tentatively identified, then incorporated into the system Letter of Agreement (LOA). The AD contract specifies that training device requirements be further identified and a brassboard prototype be developed for high-risk tasks prior to OT I. After training device requirements are validated during OT I, the requirements are defined in more detail and incorporated into a TDR (B20), the Phase III Acquisition Plan (B24), and the FSED contract (C1a). The contract will require that a prototype device be available prior to OT II.

Training device requirements are identified or reviewed during the various times when task and skill analysis data and the OICTP/ICTP are updated. Procedures have not been developed to a high point, but general guidance is available in the USATSC Training Development Study Guide, the DARCOM/TRADOC

Technical Documentation and Training Acquisition Handbook, and TRADOC Circular 70-1. In addition, PM TRADE is available to provide assistance while training device requirements are identified and training device specifications are developed.

Usually the PM for the materiel system is responsible for the acquisition of training devices, with actual development undertaken by the system prime contractor or a subcontractor. The training proponent is responsible for identifying training device requirements, establishing the functional requirements for such devices, monitoring development, and conducting DTs and OTs for the device. If the training device has been designated as a major system, OTEA is responsible for its testing.

As noted under Event B18, a separate set of requirement documents must be prepared if development of a training device involves a technical risk. Such devices may undergo their own DT and OT.

The steps which should be followed during development and testing of training devices in the FSED Phase are as follows:

- o Translation of training device requirements into training design specifications and procurement packages
- o Solicitation and award of the training device contract
- o Fabrication of training device
- o Contractor testing of training device
- o Government developmental test of training device
- o Contractor training of trainer device instructor/personnel
- o Training device prototype delivery to TRADOC for training of player personnel for OT II
- o Operational test of device (performed as prelude to OT II)
- o Preparation of production specifications and procurement package

- o Completion of CTEA on training device
- o Training device acceptance IPR

The development of training devices usually lags behind the development of the materiel system. Therefore, if they are to be available when needed, the devices must be developed in a timely manner. The early identification of training device requirements and the development of cost estimates are imperative so that a portion of the funds for prime system development can be allocated to acquiring the training device and to its support requirements. The training device contractor must have access to component design during the early portion of the FSED Phase.

EVENTS C3 and C4--DEVELOPMENTAL TEST II (DT II) AND OPERATIONAL TEST II (OT II)

OVERVIEW

Purpose

The purpose of DT II is to demonstrate that the engineering design risks have been minimized and that the engineering process is complete. The purpose of OT II is to demonstrate the military utility, operational effectiveness, and suitability of both the materiel and its support subsystems.

Relation to Other LCSMM/IPS Events

These events are comparable to Event 51 of the LCSMM. They provide the data for making the decision for entering the production phase of the materiel acquisition process.

TSM/AO Responsibilities

The TSM/AO and/or representatives of the training proponent act as observers during DT/OT II.

Phasing

DT II can begin shortly after approval of the Detailed Test Plan. When possible, DT and OT II are conducted separately and about 6 months apart. This provides an opportunity for correction of deficiencies determined in DT II prior to OT II.

INPUT DATA/EVENT DATA BASE

Test and Evaluation plans prepared during Event C1d. These plans are contained in the four test and evaluation documents prepared prior to OT II.

OUTPUTS AND END PRODUCTS

Data collected during DT/OT II. These data are used to prepare test reports.

REFERENCES

AR 70-10, Test and Evaluation During Development and Acquisition of Materiel

AR 71-3, User Testing

OTEA, Operational Test and Evaluation Methodology Guide

ARI TR-78-A7, TSM Guide to Training Development and Acquisition of Major Systems

Mitre Corporation, A Guide for TRADOC System Managers

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C3

For major systems the designated operational tester (OTEA) is responsible for conducting the OT. For non-major systems some element of TRADOC usually conducts the OT. For training devices which have not been designated as a major system, TRADOC is responsible for conducting the training device OT.

During DT II the TSM/AO and representatives of the training component function solely as observers. They will be particularly interested in monitoring training for operator and maintenance personnel prior to DT II. The effectiveness of SPA/ETM material probably will first be assessed at this time.

Before OT II, representatives of the training community will monitor the training of OT player personnel. The critical test issue during this training concerns whether the training material can prepare personnel to perform in accordance with training standards.

During OT II, training representatives must be especially attentive to the proficiency of operator and maintenance personnel, and the tactical proficiency of crews/units during various mission operation tests. During OT II, training representatives begin to form judgments about another critical training issue, namely, does the training support material cover appropriate tasks with appropriate training standards?

EVENT C5--DT II/OT II TEST REPORTS

OVERVIEW

Purpose

During this event DT and OT test results are analyzed, then reported in separate test reports. These reports provide the basis for an Independent Evaluation Report (IER) by the designated tester and for evaluation position reports by other interested agencies. Essentially, these reports describe what must be done, if anything, before the materiel system, including its support systems, can enter the production phase of its life cycle.

Relation to Other LCSMM/IPS Events

Reports generated during this event, especially the evaluation reports, provide the basis for the decisions made during the third DSARC/ASARC/IPR (Event C12). Event C5 is part of Event 54 of the LCSMM.

TSM/AO Responsibilities

The DT and OT Test Reports and the evaluation reports which follow are prepared by OTEA and/or an element of TRADOC. The TSM/AO should assist interested TRADOC agencies to obtain the test reports and other data inputs necessary to develop their evaluation reports. Also, the TSM/AO is responsible for staffing the training proponent and logistician reports with TRADOC and for assuring that the approved reports are forwarded to the DSARC/ASARC/IPR committee.

Phasing

This event will begin immediately after OT II and will be completed, except for staffing requirements, within 2 months.

INPUT DATA/EVENT DATA BASE

Test data collected during DT II and OT II. For major systems and systems of special interest, the Test Reports will be prepared by the material

developer (DT report) and by OTEA (OT report). These reports will serve as inputs to TRADOC agencies which will prepare an evaluation report for their area(s) and interests. Data from DT and OT are available immediately after test completion. Test reports describing/summarizing these data should be available one month following test completion. Test data for preparing Test Reports are obtained directly from the test data collection team. Test Reports are obtained from the DT tester (usually some element of TECOM), from OTEA (for major systems), or from an element of TRADOC if the system is a non-major one.

OUTPUTS AND END PRODUCTS

For DT and OT, respectively, a Test Report that summarizes all data collected in support of test objectives, and an Independent Evaluation Report. In addition, the training developer, combat developer, and logistician usually will prepare separate evaluation reports covering selected components of the materiel support package. The reports, especially the IER, are used by the DSARC/ASARC/IPR committee to decide whether the materiel will enter a production stage or must undergo further development and testing. The reports also are used to update training plans and prepare a final QPRI, a final Basis of Issue Plan, and an updated Acquisition Plan. The Test Reports should be available one month after OT II. The evaluation reports should be available in draft form 2 months after OT II.

REFERENCES

- AR 70-10, Test and Evaluation During Development and Acquisition of Materiel
- TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training
- TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures
- OTEA, Operational Test and Evaluation Methodology Guide

EXAMPLES AND ILLUSTRATIONS

See Illustrations for Event B7 (page IV-17).

PROCEDURES FOR ACCOMPLISHING EVENT C5

Immediately following DT and OT II the designated testers for those activities prepare a Test Report (TR). This report describes the conditions under which the test was conducted and the findings that resulted. Also, the TR describes any departure from the Test Design Plan, the reasons for such departures, and their impact on the reliability and validity of the test data.

The data presented in the Test Report will be organized around test objectives developed for OT. These objectives were derived from issues or questions relating to the suitability of the test support packages provided for OT II (OT I also). These test support packages are:

- o Maintenance Test Support Package
- o New Equipment Training Test Support Package
- o Doctrine and Organizational Test Support Package
 - Means of Employment
 - Organization of Employing Units
 - Logistical Concepts
 - Mission Profile
 - Test Settings
- o Threat Support Package
- o Training Support Package (provided by training proponent)

Following preparation of the TRs, the reports are distributed to the various TRADOC agencies that were involved in preparing the OT test plans. Each of these agencies reviews the findings for its area(s) of concern and prepares a command position. For example, LOGCEN will review data pertaining to logistical concepts, the combat developer will review data related to means of employment,

and so on. These positions are comparable to those prepared by the designated Independent Evaluator (OTEA) for major systems. However, the Independent Evaluator must prepare a formal IER covering all aspects of OT II while other interested agencies prepare an evaluation report covering only their areas of concern.

In evaluating the OT findings, the DT Test Report must be reviewed, as well as data from any other Test and Evaluation activities that might not have been part of a DT or OT.

Reviewing and evaluating DT and OT provides the basis for judging the suitability of support packages. A decision must be made as to whether components of these packages need to be revised and undergo further development and test, or whether their further development and production can proceed as planned. To arrive at this decision some general questions should be asked with respect to each component of a support package. The following questions are illustrative:

- a. Were test plans followed? Were certain tests incomplete, omitted, conducted under unanticipated conditions or less than satisfactory conditions? Reliability and validity of the test data are assessed on the basis of answers to these and similar questions.
- b. Were all training objectives and subobjectives met? If not, why? Were training materials available for test? If they were not, subsequent testing may be required. Were player personnel representative of the target population? Unsatisfactory results may be due to the use of player personnel who did not meet selection criteria. Conversely, if player personnel were overqualified, training data may be inflated.
- c. Were instructors properly trained? Apparent deficiencies in training material or selection criteria may be due to poor training of instructors. Evaluation of training components must be based in part on an observation of NET prior to OT II and a review of the POI employed during NET.
- d. Were performance test procedures faulty? In some instances procedures for conducting performance tests cannot be implemented as planned, or test/performance recording procedures are inadequate. This is especially likely for trial ARTEPs.

- e. Were training criteria set at too low or too high a level? If persons who performed poorly during pre-OT training perform acceptably during the OT, this might indicate that training criteria may be too high. On the other hand, if persons who undergo successful training cannot perform satisfactorily during the OT, then (1) training standards may be too low, or (2) training for any particular MOS and skill level may not cover all required tasks.
- f. Were training materials/devices/POIs, etc. deficient? When training programs/material cannot prepare persons to meet training objectives, deficiencies usually exist in the material/program.

As already noted in this handbook, two critical training objectives/issues must be assessed during an OT, especially during OT II. These are:

- a. Can the training programs/material train persons to meet training standards?
- b. Can persons who meet training standards meet field performance requirements?

Some important training subobjectives include: Can SPAS/ETM effectively train operator and maintenance personnel? Does effective performance on training devices correlate with effective field performance? Does training on training devices transfer to the equipment?

In general, in an evaluation report emphasis will be on those objectives and subobjectives that were not met. The foregoing questions may help detect the reasons for such failures. Means of correcting the deficiencies will be proposed, and the degree to which the means/technical fixes will be successful should be estimated.

Following preparation of the OT II test report and all independent evaluation reports, the CTEA/COEA for the training approach must be updated (AR 70-10). Also, for those training devices being developed under a TDR/TDLR, a CTEA update must be prepared. This activity can be performed as part of Event C9.

The OT II evaluation reports prepared by the training/combat developer, the logistician, and others are staffed throughout TRADOC and eventually become command positions. Draft versions of these position papers can be forwarded to OTEA or whoever is the independent tester. The final command position is forwarded to members of the DSARC/ASARC/IPR committee. As a final step in preparing these position reports, the training developer will be required to recommend continuation of type classification of the system from a training point of view.

EVENT C6--FINAL QQPRI AND MOS DECISIONS

OVERVIEW

Purpose

The purpose of this event is to provide the Qualitative and Quantitative Personnel Requirements Information (QQPRI) in final form to MILPERCEN so that agency can plan to acquire the necessary personnel for Initial Operational Capability (IOC).

Relation to Other LCSNM/IPS Events

This event is not specifically identified in AR 11-25 but is contained in LCSNM Event 60, Update Acquisition Plan.

TSM/AO Responsibilities

The final QQPRI is the responsibility of the materiel developer but input is required from the combat and training developers. These inputs represent the final TRADOC reevaluation of the MOS decisions. The TSM/AO is responsible for obtaining inputs for TRADOC agencies and for coordinating the draft FQQPRI with interested TRADOC agencies (see Figure V-3, page V-11).

Phasing

The final QQPRI is developed by the materiel developer approximately 30 months prior to IOC and must arrive at MILPERCEN at least 27 months before IOC. The MOS decisions must be announced by MILPERCEN 24 months prior to IOC (AR 611-1).

INPUT DATA EVENT/DATA BASE

- a. PQQPRI (Event B15, page IV-59).
- b. OT/DT II Test Reports (Event C5, page V-33).

OUTPUT AND END PRODUCTS

- a. Final QQPRI (see AR 611-1)
- b. Input to BOIPC (Events 7 and 8)
- c. Input to TOE changes
- d. Input to the New Equipment Personnel Requirements Summary (NEPRS)

REFERENCES

- AR 71-2, Basis of Issue Plans
- AR 611-1, Military Occupational Classification Structure Development and Implementation
- DARCOM-P 700-9-1, Guide for Integrated Logistic Support During the Conceptual Phase

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C6

The specific procedures and responsibilities for preparing the final QQPRI are presented in AR 611-1. The issues for consideration by proponent school/agency are:

- a. Are all system components and subcomponents identified and listed in QQPRI documentation, to include MOS and Annual Maintenance Man Hours (AMMH) for each level of maintenance?
- b. Is the MOS, and if appropriate SSI, proper to support equipment in proposed TOE?
- c. Are skill levels correct for the MOS and expertise required?
- d. Will training be sufficient to provide required expertise?
- e. Will there be a sufficient number of MOS-trained personnel in the field to support the equipment?

The test result areas to be addressed by the training developer are:

- a. The subject matter and scope of instruction required by each MOS/SSI.
- b. The time and resources required for the recommended training.

The TSM/AO should coordinate the flow of information required and assure adherence to schedules. In addition the TSM/AO assures that TRADOC inputs to the FQQPRI agree with the draft TOE prepared during Event C11, Preparation of Draft TOE.

EVENTS C7 and C8--CHANGES TO UNIT STRUCTURE AND PREPARATION OF BOIPC

OVERVIEW

Purpose

The purpose of these events is to prepare a final Basic of Issue Plan (BOIP) based on the information gained from OT/DT II and provided in the QOPRI. The BOIPC is a complete plan that projects the organizational placement of new items of equipment in Trade-Off Determination (TOD)/Table of Distribution and Allowances (TDA), Common Table of Allowance (CTA), and Joint Table of Allowance (JTA).

Relation to Other LCSMM/IPS Events

Listed as Events 7 and 8 in the text and Events 6 and 7 in the supporting block diagram of TRADOC Regulation 600-4, the Unit Structure Changes and BOIP are not specifically itemized in the LCSMM of AR 11-25 but rather are incorporated in Event 60, Update Acquisition Plan.

TSM/AO Responsibilities

The combat developer has responsibility for preparing the BOIPC. It is approved by DA and published/distributed by TRADOC. The TSM/AO should monitor the schedules, as the data contained in the BOIPC are required as input to other events. TSM/AO staffing and coordination requirements are outlined in Figure V-3, page V-11).

Phasing

The BOIPC will be submitted 12 months prior to the type classification STANDARD (LCCA) data.

INPUT DATA/EVENT DATA BASE

- a. QQPRI (Event C6, page V-41).
- b. OT/DT II Test Reports (Event C5, page V-35).
- c. BOIPT - Event B16 (page IV-65).

OUTPUT AND END PRODUCTS

The output of this event, the BOIP, is used to prepare the necessary TOEs and to plan for the acquisition of the designated amount of equipment.

REFERENCES

- AR 71-2, Basis of Issue Plans
- AR 71-9, Materiel Objectives and Requirements
- AR 310-31, Management System for Tables of Organization and Equipment
- AR 611-1, Military Occupational Classification Structure, Development and Implementation
- DARCOM Regulation 11-27, Life Cycle Management of DARCOM Materiel

GENERAL PROCEDURES FOR ACCOMPLISHING EVENTS C7 and C8

The BOIP is prepared by the combat developer after receipt of the final QQPRI and Feeder Data. Unit structures are changed as necessary on the basis of the data obtained from OT/DT II. Once approved by DA, the BOIP is published and distributed by TRADOC to be used by:

- a. HQDA and materiel developer to establish quantity of item for purchase.
- b. Combat developer for revising TOE.
- c. Major commands for revising TDA, CTA, and JTA.

The procedures for preparing the BOIP are presented in AR 71-2, as are the input requirements for the combat and training developers. The flow chart in Figure V-6 (taken from Figure 3-6, AR 71-2) shows the interactions necessary in the BOIP process. The TSM/AO will monitor these activities and assure that responsive schedules are met.

BOIP-II

<u>Responsible Agency</u>	<u>Required Action</u>
MATERIEL DEVELOPMENT	Submits final DA Form 3362b-R and QQPRI to TRADOC.
TRADOC	Develops BOIP by coordinating with TRADOC schools/centers, other cbt dev and TDA, JTA and AOP proponents as required. BOIP-II will include all requirements. Within 90 days TRADOC schools/centers and other proponents will provide requirements to TRADOC. These requirements will be reviewed/revised/consolidated and submitted to HQDA for approval (with copy to DARCOM (EARA)).
HQDA	Approves, adjusts, or disapproves and returns to TRADOC (with info copy to DARCOM and EARA).
TRADOC	Publish if approved. Provides HQDA, DARCOM (EARA) and interested activi- ties copies. EARA provides DARCOM activities copies.
TC/LCC-A	BOIP-II is a prerequisite for TC and is included in IPR package.
Proponents	Includes the item of equipment in documents reflected in the BOIP (para 2-16).
TRADOC	After the BOIP has been applied to all documents (para 2-17c); TRADOC will request HQDA to retire the BOIP to history file.
HQDA	Retire BOIP to history file.

Figure V-6. Flow Chart for BOIPC (from AR 71-2)

EVENT C9--UPDATE OF TRAINING PLAN

OVERVIEW

Purpose

During this event an updated ICTP is prepared. This plan contains changes in training plans and support requirements made necessary by OT II findings.

Relation to Other LCSMM Events

This event is part of Event 57a of the LCSMM model. It provides the training inputs for preparing the updated plan for acquiring the training support system.

TSM/AO Responsibilities

The training proponent prepares the updated plan. The TSM/AO provides assistance as requested. Staffing and coordination requirements are similar to those described for Event A7 (page III-101) and Event B17 (page IV-70).

Phasing

Event C9 will begin shortly after the training proponent's evaluation report for OT II is prepared. It must be completed as soon as possible, preferably within 2 months, so that it can affect on-going training development activities.

INPUT DATA/EVENT DATA BASE

The ICTP prepared during Event B17; the most recent TASA data provided by the contractor; all OT II evaluation reports and position papers; and DT II IERs. All data will be available at the time Event C9 activities begin. However, if the IER for DT II recommends major changes in the materiel, then this event (C9) cannot be completed until data, especially LSA reports reflecting these changes, are available.

The ICTP can be obtained from the training proponent; all DT and OT reports can be obtained from the materiel developer and OTEA/training developer, respectively. LSA reports can be obtained from the contractor or the materiel developer. As noted above, these reports may not reflect recommended materiel changes based on DT II findings.

OUTPUT AND END PRODUCTS

The output of this event is an updated ICTP for use in final cost estimates of the system and in planning training.

REFERENCES

TRADOC Regulation 350-2, Development, Implementation, and Evaluation of Individual Training

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

TRADOC Pamphlet 351-4, Job and Task Analysis Handbook

AR TR-78-A7, TSM Guide to Training Development and Acquisition of Major Systems

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C9

During OT II a variety of training materials, devices, and one or more POIs are evaluated. Procedures for correcting identified deficiencies must be incorporated into the updated ICTP. At a minimum the following topics will be considered during ICTP update. Are the specifications for training materials and devices acceptable? If not, they should be modified. Is the training strategy developed in support of the materiel acceptable? Has the proper mix and sequence of institutional and unit training been identified? If the evaluation report suggests otherwise, necessary changes must be made and incorporated into the updated ICTP (see Events B12 and B17).

During Event C9 considerable emphasis must be placed on preparing for the development of institutional training courses. Plans will be refined for obtaining instructors and for sending them to Instruction and Key Personnel training courses. The degree to which the contractor--developed, and TRADOC-approved, POI is used for training OT II personnel will be assessed and modified if required. Attention will be given to identifying those SPAs/ETM materials that can be used in institutional courses.

Logistic Support Analysis Record (LSAR) data, lists of collective and individual tasks, draft SQT tests, etc., will be reviewed to determine whether they can be modified for use in institutional training. These data/materials will be used whenever possible.

The foregoing activities will result in an updated, more detailed version of the ICTP prepared during Event B17. This ICTP must be further updated by examining training support requirements. Estimates of requirements for instructors, facility, training aids, ammunition, ranges, etc. must be updated.

Finally the training proponent, is undertaking the above activities, the materiel developer is updating plans and requirements for new equipment training. Updated NET plans, to include support requirements, must be incorporated into the revised ICTP.

EVENT C10--UPDATE OF ACQUISITION PLAN (AP)

OVERVIEW

Purpose

The Acquisition Plan (AP) is the document that contains the basic data for preparation of the Decision Coordinating Paper (DCP) for ASARC/DSARC III. A decision on full-scale production will be based on the data, plans, and projections it contains. This event in the IPS is directed toward updating the requirements in Sections IV and V of the AP.

Relation to Other LCSMM/IPC Events

Event C10 corresponds directly with Event 60 of the LCSMM.

TSM/AO Responsibilities

The preparation of the Acquisition Plan is the responsibility of the materiel developer, usually DARCOM, in coordination with the TRADOC proponent and the TSM/AO. The TSM/AO will review all supporting material, most of which was developed during preparation of the ROC, and insure that the input data are consistent and the latest available.

Phasing

This event must be completed 3 months before the ASARC review meeting and therefore 12 months before the scheduled ASARC III.

INPUT DATA/EVENT DATA BASE

- a. Test Reports OT/DT II (Event C5, page V-35).
- b. Training Plan (Event C9, page V-46).
- c. BOIPC (Events C7/C8, page V-43).
- d. QQPRI (Event C6, page V-41).
- e. AP (Event B24, page IV-97).

OUTPUT AND END PRODUCTS

The output of this event, the updated Acquisition Plan, is the basic information needed to prepare the DCP and associated documents for decision at ASARC/DSARC III.

REFERENCES

- AR 15-14, Systems Acquisition Review Council Procedures
- AR 70-1, Army Research, Development and Acquisition
- AR 70-27, Outline Development Plan, Development Plan, APM, DPM, and DCP
- AR 700-127, Integrated Logistic Support
- TM 38-703 Series, Integrated Logistic Support
- TM 38-710, Integrated Logistic Support: Implementation Guide for DOD Systems and Equipment

EXAMPLES AND ILLUSTRATIONS

See AR 70-27 and AR 700-127.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C10

The procedures for preparing the Acquisition Plan are presented in AR 70-27 and AR 700-127. In Event C10 the training developer is responsible for developing inputs to Sections IV and V, as follows:

- o Section IV. New and updated support testing requirements.
- o Section V. New and updated planning for any further testing and instruction, individual, and crew training anticipated.

The TSM/AO should assure that any changes in training plans made as a result of the data gathered and evaluated during OT/DT II are incorporated into the AP.

If the prospective production contractor will be tasked to train the initial personnel (i.e., the first and/or first and second battalion(s) fielded), then

the training developer must make certain that he will have constant interaction with that contractor. Toward this end, standard contract paragraphs are incorporated in the production RFP to enable him to obtain training data and evaluate procedures during the production phase.

EVENT C11--PREPARATION OF DRAFT TOE

OVERVIEW

Purpose

The purpose of this event is to identify those changes in the draft TOEs developed for OT II that are necessary to fulfill the mission as stated.

Relation to Other LCSMM/IPS Events

This event, although not specifically referenced in AR 11-25, is incorporated in LCSMM Event 59. Decisions made during the event may require modification of the FQQPRI prepared during Event C6.

TSM/AO Responsibilities

The development of the TOE(s) is the responsibility of the combat developer as is the incorporation of any changes. The TSM/AO will assure the information flow described below and monitor the schedule of required submissions. These changes take the form of a consolidated change letter.

Phasing

The incorporation of changes is an iterative process but the final drafts must be completed for incorporation into the AP.

INPUT DATA/EVENT DATA BASE

- a. AP (Event B24, page IV-97).
- b. Test Reports OT/DT II (Event C5, page V-35).
- c. QQPRI (Event C6, page V-41).
- d. BOIPC (Events C7/C8, page V-43).

OUTPUT AND END PRODUCTS

The output of this event is the draft final TOE(s) for distribution by TRADOC, once approved, to the units for planning the introduction of the new system.

REFERENCES

AR 71-2, Basis of Issue Plans

AR 310-31, Management System for Tables of Organization and Equipment
(The TOE System)

AR 570-2, Organization and Equipment Authorization Tables--Personnel

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C11

The incorporation of changes, if any, in TOE(s), dictated by the evaluation of OT/DT II data is an iterative process. Significant coordination is required with those responsible for preparation of the final QQPRI and BOIP. Though it appears as the second to last event in PHASE III of the IPS, the final results of this event must be reflected in Event C6, QQPRI. This obviously requires interaction between the combat developer and materiel developer to ensure consistency.

The TSM/AO should assure this information flow and maintain the schedules described in Events C6 and C7.

EVENT C12--ASARC DSARC IPP II.

OVERVIEW

Purpose

This event is the decision process required for production and deployment of the new system.

Relation to Other LCSMII/IPS Events

This event is the same as Events 71 and 98 of the LCSMII.

TSM/AO Responsibilities

-- The TSM/AO will continue as a member of the working group that prepares for the ASARC and prepares the DCP from the data, plans, and projections in the AP.

Phasing

Approximately 4 to 6 months before a scheduled milestone (I, II, or III) decision for an OSD major system, the DSARC will initiate action to request a milestone meeting. Approximately 11 months prior to a scheduled ASARC, the ad hoc planning meeting will be held and an agenda for the ASARC will be established as an enclosure to the ODCSRDA guidance directive, AR 15-14.

INPUT DATA/EVENT DATA BASE

The input to this event is the information contained in the Acquisition Plan, plus any peripheral studies and dissenting opinions submitted directly to the ASARC review committee.

OUTPUT AND END PRODUCTS

The output of Event C12 is a decision to acquire the system as recommended, delay until further tests are completed, or stop production because of a change in threat, mission technology, or other critical factors.

REFERENCES

- DODD 5000.1, Major System Acquisition
- DODD 5000.2, The Decision Coordination Paper (DCP) and the Defense System Acquisition Review Council
- DODD 5900.26, Defense Systems Acquisition Review Council (DSARC)
- AR 15-14, Systems Acquisition Review Council Procedures

EXAMPLES AND ILLUSTRATIONS

The Checklist for Milestone III Reviews (Appendix C, AR 15-14) is reproduced in Figure V-7).

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT C12

The procedures for this event are well documented in AR 15-14, and Appendix C of that document, the Milestone III checklist, is presented in Figure V-7. It should be noted that, with the current emphasis on collapsing the development cycle as much as possible, some of the events in this text have been revised and combined. If there is no requirement for an OT/DT IIa or III, then the final recommendations of all agencies must be based on the results of OT/DT II. This includes the final decisions on training plans and devices.

APPENDIX C CHECKLIST FOR MILESTONE III REVIEWS (END FULL-SCALE-ENGINEERING DEVELOPMENT PHASE, BEGIN PRODUCTION AND DEPLOYMENT PHASE)

The following items will be reviewed at Milestone III:

a. Need. The mission element task is reaffirmed to be essential.

b. Threat. The updated threat is credible, addresses the correct timeframe, has been validated by CG Commander, INSCOM, in coordination with ACSI, and, when appropriate, by DIA.

c. Recommended System/Program Alternative.

- (1) Satisfies the mission element need(s).
- (2) Is most cost-effective alternative.
- (3) Is within established constraints.
- (4) Is affordable.
- (5) Provides for NATO standardization and interoperability.
- (6) Balances cost, schedule, and performance effectively through tradeoff.

d. Operational Factors.

- (1) Force structure plan and schedule for phase-in; AAO and distribution plan.
- (2) Impact on Reserve Components.
- (3) Impact on MOS structure and individual training.
- (4) Use of simulators for individual and unit training.
- (5) Performance goals and thresholds reaffirmed.
- (6) Disposition of current family or series equipment being replaced or phased out.

e. Logistical Factors.

- (1) Minimize O&S costs.
- (2) Minimize maintenance and support personnel.

(3) RAM goals and thresholds reaffirmed.

(4) ILS planning to meet needs of operational units.

f. Cost.

(1) Validity of cost estimates, including COEA costs.

(2) Design-to-cost (DTC) goals and thresholds reaffirmed for—

- (a) Hardware design-to-cost.
- (b) O&S cost.

g. Acquisition Strategy. Has been updated and is being executed.

(1) Business planning supports the acquisition strategy and provides flexibility for production rates and quantities when options are used.

(2) Issues concerning production, producibility, quality assurance, and facilities are identified and managed satisfactorily.

(3) Requisites defined for future production decisions.

(4) Competition; second source.

h. Schedule. Goals and thresholds reaffirmed.

i. Testing.

(1) Results of DT/OT II support recommendations.

(2) Adequacy of testing, critical issues remaining to be resolved, quality of test efforts, validity of test results, and plan for further testing.

j. Production Readiness Review Completed.

k. Program Management Structure.

l. TJAG Legal Review. Consistent with international law.

Figure V-7. Checklist for Milestone III Review. (From AR 15-14)

SECTION VI

IPS MODEL:

PRODUCTION AND DEPLOYMENT

Overview

During the Production and Deployment Phase (Phase IV of the LCSMM), operations and maintenance personnel are trained, system deficiencies identified in testing are corrected, equipment is procured and distributed, and logistic support is provided. The training activities involve the full-scale implementation of resident and unit training programs.

During this phase the major training activities are:

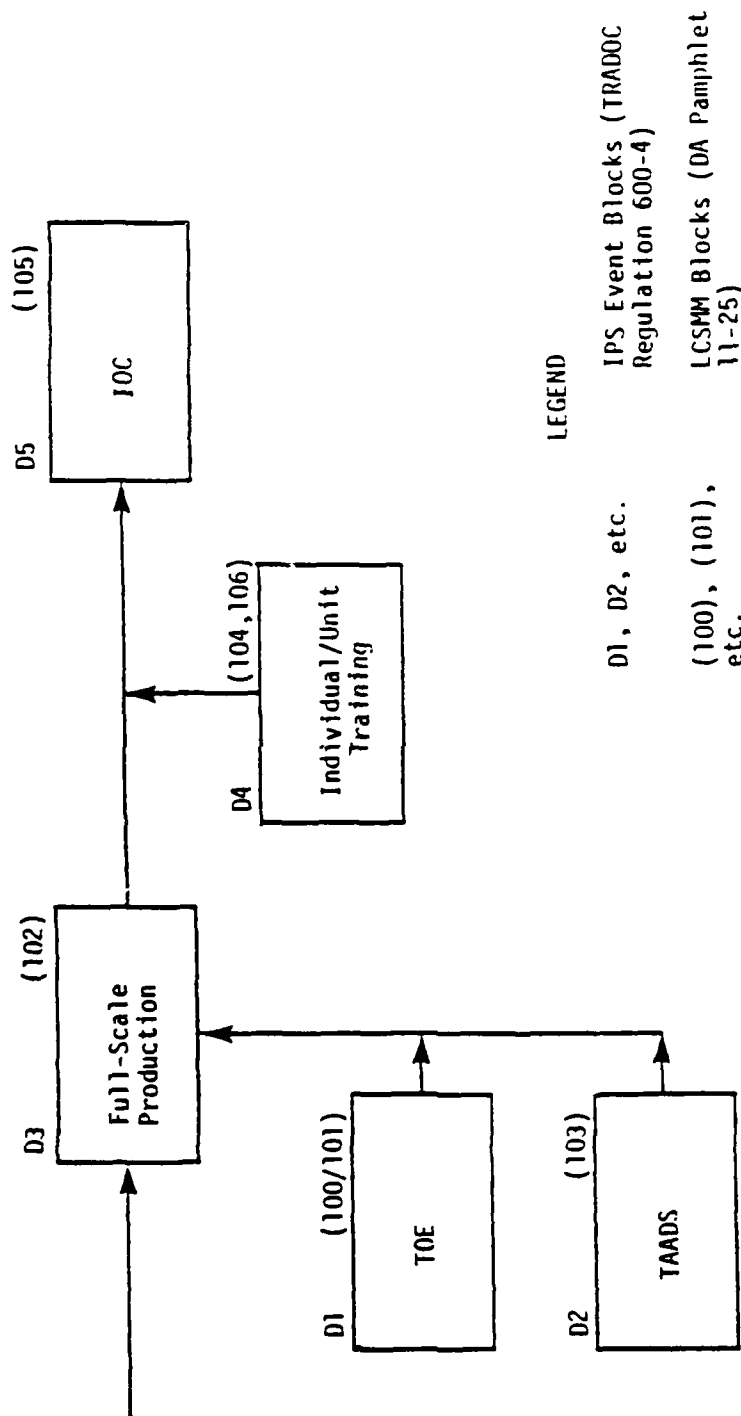
- o Determining quantity of and production of training materials and devices
- o Field testing the program(s)
- o Updating the training plan(s)
- o Implementing the program
- o Evaluating and revising the program
- o Providing inputs to LCSMM events as required

For those systems where a decision has been made to conduct Developmental Test/Operational Test (DT/OT) III, additional activities may include preparing a test plan and a test support package, evaluating OT III results, and updating the Individual and Collective Training Plan, CTEA/COEA, and Acquisition Plan. Figure VI-1 shows the major events which make up the Production and Deployment Phase.

Scope

The scope of the training activities in the full-scale production phase includes all activities necessary to provide trained operator and maintenance

PRODUCTION AND DEPLOYMENT PHASE IV



LEGEND

- D1, D2, etc. IPS Event Blocks (TRADOC Regulation 600-4)
- (100), (101), etc. LCSMM Blocks (DA Pamphlet 11-25)

Figure VI-1. Major Events of Production and Development Phase, LCSMM

personnel in sufficient quantity and of sufficient quality to allow the first operational unit to perform its mission. These activities are described in the discussion of the following events, leading from the ASARC/DSARC III decision to Initial Operational Capability (IOC).

EVENT 01--REVISION AND PUBLICATION OF TOE(s)

OVERVIEW

Purpose

The purpose of this event is to update the Table(s) of Organization and Equipment on the basis of the evaluations of the data obtained during OT II.

Relation to Other LCSMM/IPS Events

The combat developments activity of the proponent school has the responsibility of modifying or updating any TOEs based on new information gained during OT II. These revisions will be submitted according to AR 310-31. The TSM/AO will assure that this is accomplished.

Phasing

The revised versions of the TOE(s) will be submitted to DA and to other interested commands and agencies as soon as possible after ASARC/DSARC approval of full-scale production.

INPUT DATA/EVENT DATA BASE

- a. Draft Plan TOE (from Event C11)
- c. ASARC/DSARC III recommended changes (from Event C12)

OUTPUTS AND END PRODUCTS

Table(s) of Organization and Equipment to be used to plan quantity and phasing of full-scale production.

REFERENCES

- AR 71-2, Basis of Issue Plans
- AR 310-31, Management System for Tables of Organization and Equipment (The TOE System)
- AR 570-2, Organization and Equipment Authorization Tables--Personnel

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT D1

The general procedures for revising and publishing the TCE(s) are described in AR 310-31. The only input the trainer has to this event is to insure consistency with the ICTP if training devices are included.

EVENT D2--DOCUMENTATION IN TAADS/CTA

OVERVIEW

Purpose

The purpose of this event is to ensure that all pertinent data about the equipment is added to The Army Authorization Documents System (TAADS) data base. In particular, appropriate changes must be made to the relevant Common Table of Allowances (CTA).

Relation to Other LCSMM/IPS Events

Event D2 of the IPS is directly related to Event 103 of the LCSMM.

TSM/AO Responsibilities

Unless HQDA (DCSOPS) requires an update in the input to the Basis of Issue Plan (BOIP), there is no TSM/AO function in this event.

Phasing

If no update is required, this event will begin immediately following ASARC/DSARC III. If an update is required, DCSOPS will designate suspense dates.

INPUT DATA/EVENT DATA BASE

- a. TOE(s) (from Event D1).
- b. BOIP (from Event C7).
- c. ASARC/DSARC recommended changes (from Event C12).

OUTPUTS AND END PRODUCTS

Updated TAADS data base and associated documents for use in Army planning activities.

REFERENCES

AR 310-34, Equipment Authorization Policies and Criteria, and Common Tables of Allowances

AR 310-49, The Army Authorization Documents System (TAADS)

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT D2

The general procedures are described in AR 71-2 and Army Pamphlet 11-25 and summarized below.

- a. Proponents of Modification Table of Organization and Equipment (MTOE) will document requirements upon receipt of published TOE or TOE changes.
- b. HQDA (DCSOPS) either will notify proponents of Tables of Distribution and Allowances (TDA) to update or will add the equipment to the TAADS data base in accordance with the approved BOIPC without input from the proponent.
- c. Common Table of Allowance (CTA) proponents will document BOIP, upon type of classification of the item.
- d. When constraints are imposed on the distribution of equipment, HQDA (DCSOPS) will notify proponents of actions that will be required to update unit TAADS documents.

EVENT 03--RESIDENT TRAINING

OVERVIEW

Purpose

Prior to Initial Operating Capability (IOC) the training proponent is concerned with establishing resident training programs, meeting training facilities requirements, supplying training support materials, and identifying support staff. As appropriate, the training and support staff members are prepared by sending them to an Instructor and Key Personnel course (part of the New Equipment Training program). Before training is begun, students must be recruited or assigned from other duties.

In preparation for IOC, institution and unit training programs are implemented, with unit training often conducted by NET teams. Collective and tactical training for units is based on draft Army Training and Evaluation Programs (ARTEPs) and trial field manuals, "how to fight" manuals, and similar documents. Following IOC the ARTEP is evaluated, then finalized; the Skill Qualification Test (SQT) program is implemented, as are plans for the continuing evaluation of the training programs.

Relation to Other LCSMM/IPS Events

Resident training programs will be implemented prior to Initial Operational Capability (IOC). Most other elements of the training system also will be implemented before IOC. Elements of the SQT program must be implemented within 12 months after IOC.

TSM/AO Responsibilities

The TSM/AO functions primarily as a coordinator and expediter while training programs are being implemented. For resident training, the TSM/AO will assure that schedules are maintained and that course development personnel consider

the use of training materials developed by the contractor, DARCOM, TRADOC, etc. This step is taken to prevent duplication of effort. Many other elements of the training system may require TSM/AO assistance as a coordinator. These are listed in TRADOC Circular 351-8 and include development of correspondence courses, field manuals, "how to fight" manuals, training circulars, training devices, and so forth. Major training activity, training activity responsibilities and coordination requirements are shown in Figure VI-2.

Phasing

TRADOC Circular 351-8, Appendix D, contains product-oriented planning schedules for all major elements of a training subsystem. Course Programs of Instruction must be submitted to HQ TRADOC for approval 27 months before IOC. If new facilities are needed, construction requirements must be submitted to MACOM 5 years prior to the date on which the facilities are to be utilized.

INPUT DATA/EVENT DATA BASE

a. Most recent ICTP.

This document, prepared during Event C8, describes the latest training plan and support requirements. The most recent ICTP should be attached to most recent version of the Acquisition Plan.

b. All draft training materials and prototype devices prepared to date.

This material will include TMs and SPAS material, draft NET program material, and any relevant material already in use in a training program. SPAS material, TMs, and NET programs are prepared by the contractor. Existing (and relevant) TRADOC courses (institution and correspondence) can be obtained from the proponent school.

c. Latest Task and Skill Analysis (FEA) Data

This material consists of an updated version of the FEA data produced during Event B3. It can be obtained from Logistics Support Analysis Reports plus other data sheets containing task and skill analysis data. These reports/data are produced by the materiel contractor.

PRODUCTION AND DEPLOYMENT PHASE

TRAINING ACTIVITIES	DCSCD	DCST	TSM	PROFONET SCHOOL	PARCOM	ADMINCEN	LOGCEN	LOGCEN SCHOOL	ATSC
NETT Implementation	R		R	I	P/C		R	I	R
NETP/NETL	R		R	I	P/C		R/I	I	R

P = Primary Proponency
 R = Review Within Mission Area
 I = Input
 C = Coordinate as Matter of Mission
 IC = Internal Coordination
 A = TRADOC Approval Authority

Figure VI-2. Training Activity Responsibilities and Coordination Requirements (from Appendix B, TRADOC Circular 351-8)

OUTPUTS AND END PRODUCTS

All training courses, devices, and training-related products/requirements cited in the ICTP.

REFERENCES

TRADOC Circular 351-8, Individual and Collective Training Plans for Developing Systems: Policies and Procedures

TRADOC Pamphlet 350-30, Interservice Procedures for Instructional System Development

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT D3

During Event D3 a variety of training-related products in addition to resident training programs must be developed and implemented. These products, and suggested Development Milestones for each, are described in TRADOC Circular 351-8, Appendix D. In Table VI-1, these products are listed under the agency, DARCOM or TRADOC, that has the prime responsibility for their development.

As noted in TRADOC Regulation 600-4, a number of actions must have occurred before resident training can start. These include:

- a. Final MOS decision announced by DCSPER/MILPERCEN.
- b. TOE approved by DA (DCSOPS), personnel requirements and schedule of training inputs (ARPRINT) determined by DCSPER.
- c. NET, including training literature and SPA material, completed (AR 350-XXX).
- d. Final approval of ICTP by DCSPER.
- e. Training equipment, aids, and devices issued.

Resident training will be conducted by a cadre of personnel trained by the materiel developer as part of the NET program. The Instructor and Key Personnel program prepared by the materiel developer should be in place in draft form prior to OT I and should receive its final evaluation during preparation for OT II. The TSM/AO will insure that suitable types and numbers of persons are sent to this course.

TABLE VI-1

LIST OF TRAINING-RELATED PRODUCTS DEVELOPED DURING PHASE IV OF LCSMM

DARCOM

Skill Performance Aids (SPAs)
Training Devices (with TRADOC)
New Equipment Training (NET)

TRADOC

Institutional Training Courses
Army Correspondence Course Program (ACCP)
Army Training Literature Program (ATLP)
Commander's Manuals (CM)
Soldier's Manuals (SM)
Job Books (JB)
Skill Qualification Tests (SQT)
Training Extension Course (TEC)
Dept. of the Army Audiovisual Production Programs (DAAPP)
Facilities, Ranges and Real Property
Training Ammunition
Collective Training (CT) and Army Training and Evaluation Program (ARTEP)
Cost and Training Effectiveness Analysis (CTEA)

Units that first receive the new equipment are usually trained by New Equipment Training Teams. Members of the unit are taught to perform individual operator and maintenance tasks with the assistance of SPAS material. Tactical and collective tasks are taught in accordance with a specific Army Training and Evaluation Program (ARTEP). A test edition of the ARTEP and its collective training (CT) support package must be prepared, produced, and distributed prior to IOC. During the following 12 months, the ARTEP and CT are then evaluated.

Within 12 months following IOC, a Skill Qualification Test program will be implemented. The material for this program is prepared by the training developer and consists of Soldier's Manuals, Commander's Manuals, and Skill Qualification Tests.

Training materials and devices usually will be produced and developed under a contract that specifies a phased procurement. After prototype material and devices have been developed, validated, and approved, and a production and deployment decision made, the contractor will be notified to begin quantity production of the material and devices.

Once sufficient quantities of materials and devices have been produced, they will undergo a field test. During such tests complete training packages will be used to train operator and maintenance personnel, and the operational effectiveness of the training program will be assessed. This process insures that the prototype material has been converted to a product that meets operational requirements. As needed, the material will be revised and revalidated.

After the field tests are completed, the ICTP may have to be revised to reflect modifications in training plans and schedules.

The foregoing activities are followed by implementation of the training program. This involves preparing for and conducting the training program(s) at each of the training locations (resident and/or unit) specified in the training plan. The necessary resources must be assembled, the instructional staff prepared, students processed into the program, and so on. As needed, continued logistical support for the program must be arranged.

After the program(s) becomes operational, its continuing evaluation and revision must be planned. These activities involve (a) conducting internal and external evaluations of the program, (b) identifying changes in field requirements, and (c) revising the program to reflect deficiencies in the program and/or changes in field requirements. TRADOC Pamphlet 350-30 describes the general procedures for maintaining instructional programs.

EVENT D4--INITIAL OPERATIONAL CAPABILITY (IOC)

OVERVIEW

Purpose

The purpose of this event is to establish a date by which production equipment, trained personnel, and logistic support will be adequate for the first troop unit to perform its assigned mission.

Relation to Other LCSMM/IPS Events

Event D4 of the IPS is the same as Event 105 of the LCSMM.

TSM/AO Responsibilities

The TSM/AO responsibilities for this event are incorporated in all the preceding events. The most pertinent for the trainer at this LCSMM point is the accomplishment of the schedules associated with Event D3.

Phasing

The phasing of this event is system dependent.

INPUT DATA/EVENT DATA BASE

The development process.

OUTPUTS AND END PRODUCTS

The first operational unit.

GENERAL PROCEDURES FOR ACCOMPLISHING EVENT D4

Essentially, the procedures for accomplishing this event are to successfully accomplish all the preceding events. At this point in the LCSMM, the materiel system and all supporting subsystems should come together to establish an operational capability for the first troop unit designated to employ the system. The unit must be adequately supported in the field in such areas as maintenance, repair parts, documentation, and training. The training requirements are for operational institutional training and appropriate unit training exercises.

APPENDIX A
STEPS GLOSSARY OF TERMS

ACQUISITION PLAN (AP). A document which records the program decisions; contains the user's requirements; provides appropriate analysis or technical options and includes life-cycle plans for development testing, production, training, and logistic support of materiel items.

ACQUISITION STRATEGY. Interrelates the various discrete acquisition policies to the peculiar needs of an individual materiel system or program so that the resulting overall plan enables DA to buy equipment that meets its stated operational needs at planned affordable costs and within schedule and logistical support goals.

ARMY ACQUISITION STRATEGY PLAN. A mutually supporting series of plans for translating the goals and management needs of the total life of a specific program into a series of interrelated actions to accomplish the program.

ARMY FACILITIES COMPONENTS SYSTEMS (AFSC). A military engineering construction support system for use in a theater of operations. It is composed of planning guidance, drawings, bills of materials, and listings in automated files describing pre-engineering facilities, buildings, other structures and works commonly required by land-based military forces for base development, lines of communication activities and tactical operations (AR 415-61).

ARMY PROGRAM MEMORANDUM (APM). A program memorandum initiated by direction of HQDA and reviewed by the ASARC when HQDA has final decision authority for a major program (AR 70-27).

ARMY SYSTEMS ACQUISITION REVIEW COUNCIL (ASARC). An Army panel composed of regular and special members (AR 15-14). Additional participants, as appropriate, may be designated by the chairman. The ASARC reviews major Army programs at specific milestones and prior to DSARC review, if one is to be held.

ATTITUDE. A persisting state of a person that influences his choice of action.

AUTHORIZATION DOCUMENTS. Authorization documents include Modification Table of Organization and Equipment (MTOE), Table of Distribution and Allowances (TDA), Common Tables of Allowances (CTA), Joint Tables of Allowances (JTA), and Additive Operational Projects (AOP). They show the requirements and authorizations for personnel, equipment, and

organizational structure of a unit. TOE and BOIP are not authorization documents, but provide a basis for the preparation of, or changes to, MTOE. BOIP also provides a basis for changes to TDA, CTA, JTA, and AOP.

AVAILABILITY DATE. The estimated date at which the production items can be made available for initial issue to the field.

BANDS OF PERFORMANCE. A cost ceiling and performance floor that describe a performance characteristic of a system. The cost ceiling is the most cost and operationally effective capability that can be achieved by the materiel developer without exceeding the maximum acceptable cost. The performance floor is the least operational capability acceptable.

BASLINE COST ESTIMATE (BCE). A document prepared by the materiel developer which is the first deliverable detailed estimate of acquisition and ownership costs. This estimate is normally performed in support of costing required for high level decisions and serves as the base point for all subsequent tracking and auditing (provides traceability).

BASIS OF ISSUE (BOI). Authority which prescribes the number of items issued to an individual, a unit, or a military activity.

BASIS OF ISSUE PLAN (BOIP). A planning document that lists specific TOE (Level 1), TDA, CTA, JTA, and AOP in which a new item of materiel may be placed; the quantity of the item proposed for each organizational element; and other equipment and personnel required as a result of the introduction of the new item. The BOIP is not an authorization document.

BEST OPERATIONAL CAPABILITY (BOC). The BOC value for reliability is defined as that upper level of reliability which is estimated to be technically feasible for the stated time frame within reasonable cost constraints and is in consonance with the highest reliability performance for which a realistic need exists.

BEST TECHNICAL APPROACH(ES) (BTA). A document prepared by a Special Task Force (STF) or Special Study Group (SSG) or jointly by the combat developer and materiel developer, which identifies the best general technical approach(es) based on the results of the Trade-Off Determination (TOD) and Trade-Off Analysis (TOA), and an analysis of trade-offs among integrated logistical support concepts, technical concepts, life cycle costs, and schedules.

BRASSBOARD CONFIGURATION. An experimental device (or group of devices) used to determine feasibility and to develop technical and

operational data. It will normally be a model sufficiently hardened for use outside of laboratory environments to demonstrate the technical and operational principles of immediate interest. It may resemble the end item, but is not intended for use as the end item.

CAPABILITY GOAL. An objective which provides the justification for specific combat and materiel developments. When achieved, the capability goal will reduce the Army's vulnerability or will provide a significant operational advantage in a specific mission area. Capability goals are expressed in sufficient detail to provide a basis for early development planning, or for evaluation of technological proposals provided by materiel developers or for evaluation of materiel proposals initiated by Army users.

CATALOG OF APPROVED REQUIREMENTS/DOCUMENTS (CARDS). A DA catalog of approved objectives and requirements which provides up-to-date reference information to the combat developer and research and development communities.

COLLECTIVE TRAINING. Group training, either in institutions or units, that prepares crews, teams, squads, platoons to accomplish the group tasks as an entity.

COMBAT DEVELOPER. The command or agency responsible for the formulation of doctrine, concepts, materiel requirements and objectives, and organization for the employment of Army forces in a theater of operations and in control of civil disturbances.

COMBAT DEVELOPMENTS. A major component of force development which encompasses the formulation of concepts, doctrine, organization, and materiel objectives and requirements for the employment of Army forces in a theater of operations, and in the control of civil disturbances. It includes development of Army functional systems (logistics, personnel, administrative, and others as designated) which impact directly on or extend into a theater of operations.

COMBAT DEVELOPMENT ITEM. A new item of equipment, developed and/or procured in response to an approved materiel requirement document, intended for use primarily in a theater of operations or in control of civil disturbances.

COMBINED DEVELOPMENT AND OPERATIONAL TESTING (DT/OT). Conducted jointly by DT and OT test organizations to achieve test objectives for both DT and OT. It can be a complete test, a subtest, or a phase of a test.

COMMANDER'S MANUAL (CM). A manual designed to describe to the battalion and company level commanders and NCO supervisors their respon-

sibilities in the overall training plan for a particular military occupational specialty (MOS). It lists all critical tasks by duty position for every skill level of a particular MOS, provides a reference to the primary training materials available, and indicates where initial qualification of each task is mastered as well as where additional training is conducted. In designating responsibility for initial task mastery, the CM indicates the appropriate institutional training locations for the Combat Arms MOS (BCT, AIT, PNCOC, BNCOC, ANCOC, SNCOC, SGM Academy, service school), or Combat Support/Combat Service Support MOS (BCT, AIT, PTC, PLC, BTC, ANCOC, SNCOC, SGM Academy, service school), and in units (supervised on-the-job training, self study, scheduled unit level instruction). It is the life cycle training plan for the MOS. The CM is, in essence, a contract between U.S. Army Training and Doctrine Command (TRADOC) and other Major Army Commands (MACOM) for individual training.

COMMON SKILL LEVEL TASK. A task performed by every soldier in a specific skill level of a specific MOS.

COMMON TABLE OF ALLOWANCES (CTA). An authorized document for items of materiel required for common usage by individuals and/or by MTOE, TDA, or JTA units and activities Army-wide, including the Reserve components. These items of materiel, referred to as CTA items, are authorized by the CTA and will not be further documented in TOE, MTOE, TDA, or JTA.

COMMON TASK. A task used by more than one training proponent for jobs they train and/or those that are required by statute or regulation to be trained by more than one proponent. From the viewpoint of a training developer, there are various degrees of commonality. A task may be common to two jobs within a skill level of an MOS, or it may be common to all jobs within the skill level. Furthermore, a task may be common to two or more MOSs within the same Career Management Field (CMF) or across CMF for which a school is proponent. Some tasks are common to most jobs in the Army. However, since the major problem in dealing with commonality is to coordinate the use of common tasks among schools, the definition of a common task, above, will be used for training development purposes.

COMMONALITY. A quality which applies to materiel or systems possessing like and interchangeable characteristics enabling each to be utilized or operated and maintained by personnel trained on the other(s) without additional specialized training; and/or having interchangeable repair parts and/or components; and applying to consumable items interchangeably equivalent without adjustment.

CONCEPT EVALUATION PROGRAM (CEP). Provides quick reaction forum for center/school commanders to firm up combat/training development

thinking. CEP allows timely evaluation of new or unique concepts and new materiel systems to provide rationale for further investigation or initiation of formal developmental contracts. Within TRADOC, innovative testing is CEP.

CONCEPT FORMULATION PACKAGE (CFP). The documentary evidence that the concept formulation effort has satisfied the concept formulation objectives. The package consists of a Trade-Off Determination (TOD), Trade-off Analysis (TOA), Best Technical Approach (BTA), and Cost and Operational Effectiveness Analysis (COEA) (AR 71-9).

CONCEPTUAL PHASE. The first phase in the Life Cycle System Management Model. The technical, military, and economic bases for the program and concept feasibility are established through pertinent studies and through the development and evaluation of experimental hardware. Threat projections, technological forecasts, and joint Army plans are examined by combat developers to determine operational capabilities, doctrine, organization, or potential materiel systems that will improve Army forces.

CONFIGURATION. The functional and/or physical characteristics of hardware/computer programs as set forth in technical documentation and achieved in a product.

CONFIGURATION CONTROL BOARD. A board composed of representatives from program/project functional areas such as engineering, configuration management, procurement, production, test and logistic support, training activities, and using/supporting organizations. This board approves or disapproves proposed engineering changes with each member recording his organization's official position. The program/project manager is normally the board chairman and makes the final decision on all changes unless otherwise directed by command policy. The board issues a directive/request to implement its decision (AR 70-37).

CONFIGURATION IDENTIFICATION. Functional Configuration Identification (FCI) - The current approved or conditionally approved technical documentation for a configuration item as set forth in specifications, drawings and associated lists, and documents referenced therein, which prescribes (a) all necessary functional characteristics, (b) the tests required to demonstrate achievement of specified functional characteristics, (c) the necessary interface characteristics with associated configuration items (CIs), (d) CI's key functional characteristics and its key lower level CIs, if any, and (e) design constraints, such as envelope dimensions, component standardization, use of inventory items, and integrated logistic support policies.

CONFIGURATION ITEM (CI). An aggregation of hardware/computer programs or any of its discrete portions, which satisfies an end-use function

and is designated by the Government for configuration management. CIs may vary widely in complexity, size, and type, from an aircraft, electronic, or ship system to a test meter or round of ammunition. During development and manufacture of the initial (prototype) production configuration, CIs are those specification items whose functions and performance parameters must be defined (specified) and controlled to achieve the overall end-use function and performance. Any item required for logistic support and designated for separate production is a configuration item (AR 70-37).

CONTRACT DATA REQUIREMENT LIST. A listing of specific requirements for data to be provided by the contractor (DD Form 1423 (Contract Data Requirements List) or DD Form 1664 (Data Item Description)) (AR 700-51).

CONTRACTOR TESTING (CT). A test or series of tests specified in a development contract, and conducted by a contractor on components, subsystems and/or systems. As in Engineer Design Tests (EDT), planned CT is included in the CTP and is fully integrated into the DT test cycle of the appropriate acquisition phase to minimize test resources and maximize usage of test data. CT I is conducted during validation and CT II during engineering development.

COORDINATED TEST PROGRAM (CTP). The key management document for assuring that integration of all appropriate testing accomplished by the contractor, materiel developer/mission assignee and the operation tester is properly planned, coordinated, conducted, analyzed, and reported (AR 70-10, AR 71-3, and DA Pamphlet 70-21).

COST AND OPERATIONAL EFFECTIVENESS ANALYSIS (COEA). A documented investigation of comparative effectiveness of alternative means of meeting a requirement for eliminating or reducing a force or mission deficiency; the validity of the requirement in a scenario which has the approval of TRADOC and HQDA; and, the cost of developing, producing, distributing, and sustaining each alternative in a military environment for a time preceding the combat application.

COST AND TRAINING EFFECTIVENESS ANALYSIS (CTEA). A methodology which involves documented investigation of the comparative effectiveness and costs of alternative training systems for attaining defined performance objectives, taking into consideration usage patterns and training scenarios. A CTEA can examine training concepts, training impacts of new materiel, organization, tactics, employment techniques, or families of systems.

CRITICAL ISSUE. Those issues associated with the development of an item or system that are of primary importance to the decision authority in reaching the decision to allow the item or system to continue into the next phase of development.

CRITICAL TASK. A task which is required for mission accomplishment, successful job performance, or survivability on the battlefield.

CRITERION-REFERENCED TEST. Measures what an individual can do or knows, compared to what he must be able to do or must know in order to successfully perform a task. Here an individual's performance is compared to external criteria or performance standards which are derived from an analysis of what is required to do a particular task.

DATA PACKAGE. Drawings for Army Training Aids (DATA) are provided to Training Audiovisual Support Center (TASC) or user units based on a proponent predetermined distribution plan or individual request. DATA packages are managed and distributed by USATSC. The package will consist of mechanical drawings, blueprints, technical specifications, performance characteristics, materials list and sources, and narrative explaining how the item is to be used in support of training.

DESIGN AUTHORITY. The officials responsible for making decisions with respect to decision-point transitions for materiel acquisition.

DECISION COORDINATING PAPER (DCP). A summary document for the Secretary of Defense that presents rationale for starting, continuing, reorienting, or stopping a development program at each critical decision point in the acquisition cycle.

DECISION RECORD SHEET (DRS). The one-page sheet prepared by the Secretary of the ASARC which will form the principal record of approved program costs, schedules, etc.

DECISION REVIEW. A program review conducted by the DSARC or ASARC, or by IPR.

DECISION RISK ANALYSIS (DRA). A specific form of systems analysis which defines and quantifies the risks of alternative actions. This structured approach includes a well-defined problem, the establishment of alternatives, sensitivity to critical factors, and the presentation of the analysis to a decision-maker.

DEFENSE PROGRAM MEMORANDUM (DPM). A program memorandum initiated by direction of the OSD. Materiel acquisition efforts covered by a DPM may be designated as either major or non-major Army programs.

DEFENSE SYSTEMS ACQUISITION REVIEW COUNCIL (DSARC). An advisory body consisting of DDRE, ASD(I&L), ASD(C), ASD(PA&E), and, for their programs, the ASD(T) and ASD(I). This council reviews major programs at critical points during the acquisition process. This review council supports the overall decision-making process by advising the SECDEF and the DEPSECDEF on (a) courses of or changes in program commitments,

(b) courses of action in response to an actual or threatened breach of a program decision.

DELIVERY SYSTEM. Any method containing plans and procedures for the presentation of instruction. Platform instruction, television, formal on-the-job training, and self-teaching exportable packages are all delivery systems.

DEMONSTRATION AND VALIDATION PHASE. The second phase (Milestone I) in the materiel life cycle. This phase consists of those steps that are necessary to resolve or minimize special logistic problems identified during the conceptual phase, verify preliminary design and engineering, accomplish necessary planning, fully analyze trade-off proposals, and prepare contracts as required for full-scale development. The validation phase may include the use of advanced development prototypes in development and operational tests. The validation process may be conducted using competitive or single contractors or by in-house laboratories.

DEPARTMENT OF DEFENSE MASTER URGENCY LIST (MUL). A listing prepared by OSD of those projects assigned to designated priority categories. It is used to expedite and allocate resources to the projects of greatest national urgency (AR 70-1).

DEPARTMENT OF THE ARMY SYSTEM COORDINATOR (DASC). The individual (or team) designated by the Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA) to function as the HQDA point of contact for all aspects of system development and to coordinate the status of all events in the Life Cycle System Management Model (LCSMM) for a major system, a designated non-major system requiring HQDA IPR approval, or one or more other similar or related non-major systems selected for DASC management (AR 70-16).

DESIGN TO COST GOAL. A specific cost established as a goal for a specific configuration, established performance characteristics, and a specific number of systems at a defined production rate. Normally, design to cost goals are expressed in constant dollars and are established for securing the Army's commitment to support full-scale development of a system.

DETAILED TEST PLAN (DTP). A set of explicit instructions for directing every phase of the test, particularly test control and data collection and analysis.

DEVELOPMENT CONCEPT PAPER (DCP). A summary document of not more than 20 pages that provides management with the essential information on a program to be reviewed by the DSARC (DODI 5000.2).

DEVELOPMENT ESTIMATE. The estimates of operational/technical characteristics, schedule, and program acquisition cost for both development and procurement when approval is granted for the program to move into full-scale development (DODI 7000.3).

DEVELOPMENT PLAN (DP). A plan prepared prior to entry into the full-scale development phase of the materiel acquisition process for developmental programs or prior to the production and deployment phase for non-developmental programs. It is prepared by the materiel developer/mission assignee in coordination with the combat developer, logistician, developmental and operational testers, and trainer. The DP constitutes a definitive plan for management of the program to accomplish the objective addressed in an approved materiel requirement document.

DEVELOPMENT TESTER. An activity engaged in the conduct of development testing that may be any one or a combination of the materiel developer's activities, including the contractor.

DEVELOPMENT TESTING (DT). Testing of materiel systems conducted by the materiel developer using the principle of a single, integrated development test cycle to demonstrate that the design risks have been minimized, that the engineering development process is complete, and that the system will meet specifications; and to estimate the system's military utility when it is introduced. DT is conducted in factory, laboratory, and proving ground environments.

DOCTRINE. The fundamental principles by which the military force or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application.

DOCTRINAL AND ORGANIZATIONAL TEST SUPPORT PACKAGE. This package contains the doctrine and approved scenario against which a system is to be tested. It should include such items as doctrinal ranges, employment methods, area or joint operations, offense and defense capabilities, mobility requirements, and doctrinal resupply and refurbishment requirements. The package will be used to test the adequacy of doctrine, organization, operating techniques, tactics, and training prior to implementing employment; and of the system for its maintenance support. The package will include a list of pertinent field manuals (FM) or FM extracts.

DUTY POSITION. "Duty position" is the same as "job". A major subdivision of a skill level. A collection of duties performed by a soldier, usually titled in the TOE/TDA by paragraph and line number; e.g., radio operator, loader/driver, personnel specialist, etc.

ECM/ESM SELF-PROTECTION EQUIPMENT. Those devices that are integral to a weapons system and/or a mobile platform and/or do not require special unit or MOS-type individual training for operation.

ECONOMIC ANALYSIS PROGRAM. The requirements and procedures for the Army Economic Analysis Program are contained in AR 11-28. The program provides for a systematic approach to the problem of choosing how to employ scarce resources in the most efficient and effective manner. When a Cost and Operational Effectiveness Analysis (COEA) is conducted for weapon/support systems on military force levels, this satisfies the requirements for economic analysis.

EFFECTIVENESS. A measure of the extent to which an item satisfies a set of specific, pre-established requirements (AR 70-10).

ENGINEERING CHANGE. An alteration in the configuration of an item delivered, to be delivered, or under development, after formal establishment of its Configuration Identification (MIL-STD-481).

ENGINEER DESIGN TESTING (EDT). A series of tests conducted by or under the control of the materiel developer to determine achievability of technical characteristics, to provide data for refining and ruggedizing hardware configurations, to eliminate design risks or to determine their manageability, and to provide for evolution of the design and verification of design changes.

ENTRY BEHAVIOR. The skill, knowledge, and/or attitude required before beginning a new segment of instruction; also may refer to the capability a person has prior to new learning.

ENTRY SKILLS. Specific, measurable behaviors that have been determined through the process of analysis of learning requirements to be basic to subsequent knowledge or skill in the course.

ENTRY SKILLS TEST. A measurement instrument designed to determine if a student already possesses certain skills or knowledges needed as a prerequisite before undertaking new instruction.

ENTRY TEST. Contains items based on the objectives that the intended students must master in order to begin the course.

EVALUATION CRITERIA. The measures used to determine the adequacy of performance.

ENVIRONMENTAL QUALITY CONTROL. Environmental preservation and improvement activities of the Army, including all actions to curtail pollution of the environment by installations, facilities, buildings, structures, equipment, aircraft, vehicles, vessels, and any other property owned, leased, and/or operated by the Army (AR 70-15).

ENVIRONMENTAL TESTS. Tests to determine whether an item or system will perform effectively in the environments of its intended use,

including geographical and climatic and where applicable, electromagnetic, radiation, and other natural or induced environments.

FAILURE DEFINITION AND SCORING CRITERIA (FD/SC). The failure definition is a statement that defines what events constitute a failure and what events may be excluded. The scoring criteria are an amplification of the failure definition and contain procedures for classifying maintainability, availability, and durability parameters.

FIELD EXERCISE. An exercise conducted in the field under simulated war conditions in which troops and armament of one side are actually present, while those of the other side may be imaginary or in outline.

FIELD USER NEEDS. The general and specific duties that will have to be taught to the trainee if he is to be able to adequately perform in a real world environment.

FIELD VALIDATION. That point in Skill Qualification Test (SQT) development where the SQT is administered to a representative sample of job incumbents. The intent is to exercise the test items in a realistic environment to determine the administrative feasibility and the appropriateness of scorable units for the target population.

FIELD VALIDATION PLAN. A document that serves as the general outline of how the SQT will be validated. It will include the identification of the validation site, MOS and number of soldiers required, and the rationale for validation site selection.

FINAL QQPRI. Contains materiel developer new equipment data update to the Provisional QQPRI. Combat developer and trainer input are added. The final QQPRI serves as the basis for the MOS/SSI decision, training, and TOE assessment, and preparation of BOIP II (AR 611-1).

FINDINGS. Statements derived from test data concerning relationships among conditions or results of test.

FIVE-YEAR TEST PROGRAM (FYTP). A synopsis of approved outline test plans and resume sheets for user testing. It is a tasking document for test execution and resource allocation that is developed within existing budget and program constraints in accordance with Army priorities for the current and budget years and provides planning guidance for the out years.

FORCE. An aggregation of units with their inherent doctrine, organization, personnel, materiel and structure, formed to meet the requirements of a specific mission, area of operation, scenario and/or strategy. A force can be conceptual, planned, programmed, or actual. It can include a few units or all the units in the Army, i.e., the Army force structure.

FORCE ANALYSIS. The determination, within projected resource constraints, of the most effective mix of units (including weapons mix) to accomplish Army missions and functions. Force analysis is concerned with a total Army force structure in terms of Army components, and major force categories such as division forces. Force analysis addresses the full spectrum of time considered by the Defense Planning, Programming and Budgeting System (PPBS), and therefore considers both programmed and conceptual forces.

FORCE DEVELOPMENT. The integration of allocated and projected Army resources into a time phased program for developing a force that is properly organized, equipped, trained, and supported to accomplish Army missions and functions worldwide. This process includes the activities of force management, force analysis, combat developments, and training.

FORCE DEVELOPMENT TESTING AND EXPERIMENTATION (FDTE). Tests that range from a small, highly instrumented, low resolution, controlled scenario field test. Data from these tests are evaluated largely by using subjective rather than analytical techniques. They are conducted to evaluate new concepts of tactics, doctrine, organization, and new items of materiel.

FORCE MANAGEMENT. The control of resources employed by the Army for force development, and embodies force planning and force programming.

FORCE PLANNING. The development of defense policies and military strategy for the attainment of national security objectives, and the determination of the force objectives, force capabilities, and resources required for the execution of Army roles and missions in support of national security objectives and military strategy. Force planning is generally associated with the development of Army Force Guidance (AFG) and the Army Capabilities Plan (ACP).

FORCE PROGRAMMING. The translation of OSD planning and programming guidance into a comprehensive and detailed allocation of forces, manpower, and fiscal resources for a five-year period. Program development culminates in the annual publication of the Program Objectives Memorandum (POM) which presents to OSD the Army's proposal for a balanced allocation of its resources within specified constraints.

FORCE STRUCTURING. The development of the specific composition of a force, by number and types of TOE units and organizations, within given guidance. It is a macro-process in that it utilizes the unit and organizations (micro-process) prescribed by competent authority.

FORMAL On-THE-JOB TRAINING (FOJT). Training which takes place in the actual work setting.

FRONT-END ANALYSIS (FEA). In training development, precisely defining performance requirements through equipment analysis and functional analysis which yields a total task list, assessing the requirements of each task against target population skills, and determining which tasks (although covered by the related technical manual) require supplementary training (Other). The analysis phase of ISD in which doctrine is combined with the job and task analyses process.

FULL-SCALE ENGINEERING DEVELOPMENT PHASE (FSED). The third phase (Milestone II) in the materiel life cycle during which a system, including all items necessary for its support, is fully developed, engineered, fabricated, tested, and initially type classified. Concurrently, non-materiel aspects required to field an integrated system are refined and finalized. These include such aspects as basis of issue plans (BOIP), personnel and publications, integrated logistic support, and modifications of doctrine, organization, and MOS.

FUNCTIONAL CHARACTERISTICS. Quantitative performance, operating, and logistic parameters and their respective tolerances. Functional characteristics include all performance parameters, such as range, speed, lethality, reliability, maintainability, safety.

GO, NO-GO. A pass-fail criterion of evaluation whereby the soldier either meets the standard or does not meet the standard.

HANDS-ON COMPONENT (HOC). That part of the SQT which actually requires the soldier to perform critical tasks (or key elements of critical tasks) on actual job equipment or simulator.

HEALTH HAZARDS/SAFETY ASSESSMENT. The evaluation of potential or real hazards to health and/or performance of user or test personnel inherent to the design and operation of materiel.

HIGH-RISK TASK. Those critical operation or maintenance procedures which have a high potential for performance shortfall and a corresponding adverse impact on overall system performance if soldiers are not trained to perform them to standard. These tasks are typically difficult to train because they are exceptionally complex and/or require a high degree of skill, have either a high frequency of occurrence on the job, a low task decay tolerance, or high consequences of inadequate performances, or any combination of the above.

HUMAN FACTORS ENGINEERING (HFE). The application of scientific principles concerning human physical and psychological characteristics to the design of equipment so as to increase speed and precision of operations, provide maximum maintenance efficiency, reduce fatigue, and simplify operations.

HUMAN FACTORS ENGINEERING (HFE) TESTING. Assessing HFE by evaluating the man-equipment combination.

INDEPENDENT EVALUATION (IE). See Independent Evaluation DT or OT.

INDEPENDENT EVALUATION, DT. The process by which the materiel developer examines development test data and test reports; extrapolates from other evidence, including experimental and analytical data; and uses engineering judgment to assess and evaluate the capabilities of the tested materiel system, including RAM. Each independent evaluation assesses the adequacy of testing and the validity of the test results.

INDEPENDENT EVALUATION, OT. The process independent of the materiel developer and the using command which is used to examine the test design and test report; to extrapolate from other evidence, including experimental, historical, and analytical data; and which provides military judgment to assess or estimate the military utility and operational effectiveness of the tested system, including RAM. For OT, it is used to concentrate on the operational aspects of the materiel system and to consider other programmed testing and comments on operational tests provided by participants in the materiel acquisition process. Each independent evaluation is used to assess the adequacy of testing and the validity of test results.

INDEPENDENT EVALUATION PLAN. The materiel developer's or operational tester's internal master plan for the evaluation of a materiel system's technical or operational effectiveness.

INDEPENDENT PARAMETRIC COST ESTIMATE (IPCE). A cost estimate, normally prepared by materiel developer and comptroller organizations, independent of functional, project manager, and contractor influence. IPCE are used to test the reasonableness of proponent estimates at key decision points including ASARC and DSARC.

INDEPENDENT EVALUATION REPORT (IER). Provides an assessment of item or system operational effectiveness versus critical issues as well as the adequacy of testing to that point in the development of the item or system.

INDIVIDUAL AND COLLECTIVE TRAINING PLAN (ICTP). A plan developed to reflect how training on new and improved equipment will be incorporated into CONUS schools, training centers, and units worldwide. The plan details all training support required for weapon/equipment systems. It also describes the training required, both individual and collective, for each MOS associated with the weapon/equipment system.

INDIVIDUAL TRAINING. Training which the individual officer, NCO, or enlisted person receives in institutions, units, or by extension self-

study, that prepares the individual to perform specified duties and tasks related to the assigned MOS and duty position.

INDIVIDUAL TRAINING & EVALUATION DIRECTORATE (ITED). The ATSC directorate designated by the TRADOC Commander to manage and supervise the development, implementation, and administration of the SQT system. When you write to ITED, use this address: Commander, US Army Training Support Center, ATTN: ATTSC-IT, Fort Eustis, Virginia 23604.

INDIVIDUAL TRAINING PLAN. A formally documented plan which presents the total training requirement for one enlisted MOS or officer specialty and which provides for resource management.

INDIVIDUALIZED INSTRUCTION. Refers, in the ISD Model, to a management scheme which permits individual characteristics of trainees to be a major determinant of the kind and amount of instruction given. Here it nearly always implies some form of self-pacing.

INITIAL OPERATIONAL CAPABILITY (IOC). The first attainment of the capability by a MTOE unit to employ effectively a production item or system, provided unit personnel have been trained to use or employ the item or system; the unit can be adequately supported in the field in such areas as maintenance, repair parts, documents, and training; and a favorable decision has been made on the qualification of the item or system for entry into the inventory for other than test purposes.

IN-PROCESS REVIEW (IPR). A review of a materiel development project conducted at critical points of the development cycle for the purpose of evaluating the status of the project, accomplishing effective coordination, and facilitating proper and timely decisions bearing on the future course of the project.

INTEROPERABILITY. The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.

INTEGRATED LOGISTIC SUPPORT (ILS). A composite of all the support considerations necessary to insure the effective and economical support of a system during its life cycle. It is an integral part of all other aspects of system acquisition and operation. ILS is characterized by harmony and coherence among all the logistic elements. The principal elements of ILS, related to the overall system life cycle, include the maintenance plan, support and test equipment, supply support, transportation and handling, technical data, facilities, personnel and training, logistic support resource funds, and logistic support management information (DODD 4100-35).

INTEGRATED PERSONNEL SUPPORT PLANNING. The planning effort which (a) formulates personnel support concepts and characteristics to be incorporated in requirements documents, system descriptions, invitations for bids, requests for proposals, performance specifications and statements of work in contractual documents; (b) influences a design development from the personnel support viewpoint and performs analyses and evaluation of personnel requirements for operation and maintenance; (c) provides a plan for the acquisition, training, distribution, and allocation of all personnel support for the system/equipment when fielded; (d) documents these concepts, requirements, characteristics, and determinations in plans for the management of the system personnel support.

ISSUES. Any aspect of the system's capability, either operational, technical, or other, that must be questioned before the system's overall suitability can be known. Operational issues are those that must be evaluated considering the soldier and the machine as an entity to estimate the military utility, operational effectiveness, and operational suitability of the system in its complete user environment.

INSTALLATION SUPPORT SCHOOL. Organized and operated by individual units or commands to meet local training requirements.

INSTRUCTIONAL CONDITIONS. The amount of participation which the instruction requires of the learner. Instructional conditions may be active (the learner produces or practices) or passive (the learner sits and listens).

INSTRUCTIONAL PROGRAM. The development of various materials (books, audiovisual productions, etc.) designed to achieve a specific training goal.

INSTRUCTIONAL SETTING. The vehicle through which a trainee who initially is not able to perform a task becomes proficient in performing the task; for example, performance aids, self-teaching exportable packages, formal on-the-job training, installation support schools, and resident schools.

INSTRUCTIONAL SUPPORT. Learning resources; different kinds of material, number of instructors, amount of time, etc., which will contribute to the learning situation.

INSTRUCTIONAL SYSTEM. The total effort, distinct from the operating system by location, authority, or mission, that is concerned with the preparation of individuals to serve the operating system.

INSTRUCTIONAL SYSTEM DEVELOPMENT. A fully documented, detailed systematic approach to instructional development. One example is TRADOC Pamphlet 350-30.

JOB. The duties and tasks performed by a single worker constitutes his job. If identical duties and tasks are performed by several individuals, they all hold the same job. The job is the basic unit used in carrying out the personnel actions of selection, training, classification, and assignment.

JOB ANALYSIS. The basic method used to obtain a detailed listing of duties, tasks, and elements necessary to perform a clearly defined, specific job, involving observations of workers and conversations with those who know the job in order to describe in detail the work involved, including conditions and standards. Job analysis produces a list of tasks essential to the performance of a job. This process involved observing the job being performed for some representative time period and classifying the behaviors observed into definable tasks.

JOB BOOK. A publication used by a soldier's supervisor in keeping track of the soldier's level of ability to perform the tasks of a specific duty position as detailed in the appropriate Soldier's Manual (SM).

JOB EXPERT. A subject matter expert (SME) who has had recent up-to-date field experience with soldiers in the MOS for the SQT being prepared and has performed or supervised the task in question. Although the terms subject matter expert and job expert are often used interchangeably, the distinction is important for the SQT developer. For example, the industry representative for an item of equipment may be an SME, but the individual who has used or supervised the use of that item in a unit is a job expert. Job experts are more useful to the SQT developer. The job expert is always an SME, but the SME is not necessarily a job expert.

JOB PERFORMANCE AID (JPA). A checklist, instruction sheet, or other device that offers a possible alternative to training rather than an actual method of training; they are developed to eliminate or minimize training requirements for some tasks.

JOB PERFORMANCE TEST. Test used to determine whether or how well an individual can perform a job. It may include either all of the job performance measures for a particular job or a subtest of the job performance measures.

JOB TRAINING PACKAGE (JTP). The concept of preparing comprehensive packages of training materials to assist individuals or units conducting training away from the TRADOC institutional setting. The JTP will consist of a duty position road map, a training manager's guide, a trainer's/supervisor's guide, a student's guide, self-contained task training materials, and a comprehensive evaluation mechanism which,

when merged, will provide a course which will enable an individual to acquire knowledges and skill progression or reinforce and/or maintain acquired knowledges and skills. The JTP will relate directly to the applicable Soldier's Manual (SM) and Skill Qualification Tests (SQT) and will prescribe the standards of acceptance required for the unit award of an MOS whenever feasible.

JOINT SERVICE OPERATIONAL REQUIREMENT (JSOR). A statement of need for the same end item of materiel for operational employment by the Army and at least one other US military service. Army-proposed JSORs usually are directed by higher authority and are prepared and processed following Required Operational Capability (ROC) procedures to the maximum extent practicable.

JOINT TESTING. That development and user testing in which the Army participates with another service and which is conducted to evaluate Army items and systems or concepts having an interface with or requiring a test environment of another service; or items and systems, or concepts of another service which require testing in an Army environment.

JOINT WORKING GROUP (JWG). The JWG is comprised of representatives for the combat and materiel developers and appropriate subject matter experts. The primary purpose of the JWG is to provide a forum for direct communication to facilitate the coordination of requirements documents. The JWG is initiated and chaired by the combat developer in coordination with the materiel developer. In the event of disagreement among the members, unresolvable by the JWG, the issue will be presented for resolution by the chairman through normal command/staff channels.

KEY ELEMENTS. Those which have been identified as being the most common sources of failure in performance of the task or as having serious consequences of failure. A serious consequence of failure is defined as something that would endanger personnel, or equipment, create an unsafe environment, or seriously affect mission performance.

LEARNER CHARACTERISTICS. The traits possessed by learners that could affect their ability to learn (e.g., age, IQ, reading level).

LEARNING ANALYSIS. A procedure to identify sub-elements that must be learned before a person can achieve mastery of the performance.

LEARNING CATEGORY. A division of learning behavior. All learning may be classified into one of four learning categories: mental skill, physical skill, information, or attitude.

LEARNING OBJECTIVE. Describes precisely what is to be learned in terms of the expected student performance under specified conditions

to accepted standards. These learning objectives identify the mental skills, information, attitudes, or physical skills that are required to perform the terminal learning objective.

LEARNING TASK ANALYSIS. Procedures used in the domain of intellectual skills to identify prerequisite tasks that must be learned before a person can learn a given task.

LETTER OF AGREEMENT (LOA). A jointly prepared and authenticated document in which the combat developer and the materiel developer outline the basic agreements for investigation (advanced development) of a potential military system (AR 71-9).

LETTER REQUIREMENT (LR). An abbreviated procedure for acquisition of low value items, which may be used in lieu of an ROC, when applicable. Low value items are low unit cost, low-risk development, or commercial items (AR 71-9).

LIFE CYCLE SYSTEM MANAGEMENT MODEL (LCSMM). This model is a flow chart which depicts the process by which Army materiel systems are initiated, validated, developed, deployed, supported, and modified.

LOGISTIC CONTROL CODES (LCC). These codes will be used to identify the life cycle status of materiel items and the degree of logistic support to be provided those items/systems. The appropriate LCC will be assigned to each materiel item when it is approved for introduction into the Army operational inventory and will be revised during the item's life cycle to assure valid support decisions and resource allocations. The LCC and their definitions are contained in chapter 9, AR 708-1.

LOGISTIC SUPPORT ANALYSIS (LSA). The systematic, comprehensive analysis including the projected service support environment of the materiel that is conducted on an iterative basis throughout the acquisition cycle. LSA is used to identify, define, analyze, quantify, and process logistic support criteria and requirements. (MIL-STD-1388-1).

LOGISTIC SUPPORT ANALYSIS RECORD (LSAR). A data system for documenting the LSA recorded in deliverable form, that is the central file of logistic support data for a specific system or item (DARCOM Supplement 1 to AR 700-127).

LOGISTICIAN. The organization responsible for the surveillance of items for general use by the Army in the field, in terms of reliability, maintainability, durability, and logistic supportability. DSCLOG performs this function as the HQDA logistician. For most equipment, this function is performed at the wholesale level by DARCOM and at the user (retail level) by TRADOC.

LOGISTICS ORIENTED SCHOOLS. The TRADOC school responsible for development of support equipment requirements and training of logistics personnel. As required, this school will assist a TRADOC proponent in ILS planning for new materiel. The logistics oriented schools consist of the Quartermaster School, Transportation School, Missile and Munitions Center and School, Ordnance and Chemical Center and School, Engineer School, and Signal School.

LOW-RATE INITIAL PRODUCTION (LRIP). A low rate of output at the beginning of production to reduce the Government's exposure to large retrofit problems and costs while still providing adequate numbers of hard tool production items for final development and operational tests before a full-production decision is made.

MAINTENANCE TEST SUPPORT PACKAGE. An assemblage of support elements that is provided before and used during development and operational testing and evaluation to validate organizational, direct support, and general support maintenance capability. It typically includes all required draft equipment publications (operator through general support maintenance equipment manuals, lubrication orders, and Equipment Serviceability Criteria manuals); repair parts; accessories; special and common tools; test, support, calibration, and maintenance/calibration shop facilities; and personnel skill requirements (AR 750-1).

MAINTENANCE SUPPORT TEAM. A small DS or GS maintenance element specifically deployed to support a unit or operation for a relatively brief period (formerly called "Contact Team" or "Contact Party").

MAJOR FORCE DEVELOPMENT TESTING AND EXPERIMENTATION. Tests which have potentially significant impact on the doctrine, organization, and tactics of the Army and are of interest to Congress, Office of the Secretary of Defense, Secretary of the Army, or Chief of Staff of the Army. Major FDTE is managed by Operational Test and Evaluation Agency (OTEA).

MAJOR ITEM. Three criteria are used to distinguish major items from secondary items. To be a major item, an item must meet each of these three criteria: (a) The item requires centralized management and control of requirements determination, procurement, maintenance, disposal, and worldwide assets and distribution at all support levels. (b) The unit value is \$1000 or more, the total inventory (or programmed procurement) is greater than \$500,000, and a "budget line" is required for this item. (c) The worldwide requirements for this item are individually specified, computed, and programmed in accordance with the Army Authorization Documents System (TAADS).

MAJOR PROGRAMS. Those projects or tasks so designated by HQDA. All programs selected for DSARC and/or ASARC review are designated as

Army major programs. The Secretary of Defense designates Army programs for DSARC review. HQDA may designate additional programs for ASARC review only (AR 15-14).

MAJOR SYSTEMS. Systems which qualify for Defense Systems Acquisition Review Council (DSARC) review and others which are critically important to the Army; are complicated, expensive, or controversial; or for any reason should involve the top management of the Army.

MATERIEL. All items necessary for the equipment, maintenance, operation, and support of military activities without distinction as to their application for administrative or combat purposes; excluding ships or naval aircraft.

MATERIEL ACQUISITION DECISION PROCESS (MADP) REVIEWS. Major management decision review conducted prior to entry into each successive phase of materiel acquisition process. The purpose of the reviews is to evaluate the development and surface critical issues prior to approval for entry into the subsequent phase. There are three levels of review: (a) The Defense System Acquisition Review Command (DSARC) reviews for major systems requiring the Secretary of Defense approval of program decisions. (b) The Army Systems Acquisition Review Council (ASARC) reviews for major and selected non-major systems requiring the Secretary of the Army approval of program decisions. (c) In-process reviews (IPR) for non-major systems.

MATERIEL DEVELOPER (OR DEVELOPING AGENCY). The command or agency which, in response to HQDA objectives and requirements, is responsible for research, development, and production validation, and product improvement of materiel systems (to include the system for its logistic support).

MATERIEL REQUIREMENT. An HQDA-approved requirement for a materiel item or system (e.g., an approved LOA, QMR, MN, TDR, ROC, TELER, or LR).

MATERIEL REQUIREMENT DOCUMENT. A document which states concisely the minimum essential operational, technical, logistical, and cost information necessary to initiate full-scale development or procurement of a materiel system. The documents used to state materiel requirements are: (a) Required Operational Capability (ROC) (AR 71-9). (b) Joint Service Operational Requirements (JSOR) (AR 71-7). (c) Telecommunications Requirements (TELER) (AR 105-22). (d) Qualitative Construction Requirements (QCR) (SP-72-011, OCE). (e) Quick Reaction Capabilities (QRC) (AR 11-8 and AR 105-7). (f) Qualitative Research Requirement (QRR) (AR 70-1. (g) Letter Requirement (LR) (AR 71-9).

MATERIEL SYSTEM. An item, system, or aggregate of systems of materiel (AR 71-9). (For the purpose of OT&E, a materiel system includes: the

operational and support hardware; the operating and support personnel; the TOE organization within which the equipment is found; the prescribed doctrine and tactics of employment; the command and control equipment and procedures; and the training program.).

MEASURE OF EFFECTIVENESS (MOE). The quantitative expression (sometimes modified by subjective judgment) of the success of a system in achieving a specified objective (AR 70-10).

MEDIA. Means for presenting instructional material to learners; for example, books, audiotapes, and filmstrips.

MEDIA POOL. All of the media options suitable for a given unit of instruction. The final media choice is drawn from the media pool.

MEDIA SELECTION. The major means of determining how instruction is to be packaged and presented to the student.

MENTAL SKILLS. Those processes of identifying, classifying, using rules, and solving problems that involve active mental processing. Mental skills employ the capability of applying the learning to some situation and demonstrating the mental skill, such as thinking, creating, and analyzing.

MILITARY ADAPTED COMMERCIAL ITEM (MACI). An item acquired with procurement appropriations that requires engineering effort, but not research and development, to study the availability and suitability of commercial items or items commercially developed for military application prior to quantity procurement of these items or models. Includes the determination of performance and quality assurance criteria and procurement of items to be evaluated. Provides for conversions (reverse engineering) of procured offshore developed items' technical data package prior to quantity production in the US (AR 37-100-75).

MILITARY CHARACTERISTICS. Those characteristics of equipment upon which depend its ability to perform desired military functions. Military characteristics include physical and operational characteristics, but not technical characteristics.

MILITARY OCCUPATIONAL SPECIALTY (MOS). A group of duty positions that have closely related duties and require soldiers to have similar qualifications. A soldier assigned to any job within the MOS group may be moved to any of the other jobs at the same skill level.

MILITARY REQUIREMENT. An established need justifying the timely allocation of resources to achieve a capability to accomplish approved military objectives, missions, or tasks.

MILITARY SPECIFICATIONS. Procurement specifications in the military series promulgated by one or more of the military agencies and used for the procurement of military supplies, equipment, or services.

MILITARY UTILITY. A consideration of the pertinent threat, concept, doctrine, environment, organization, skills, logistic supportability, operational performance, and unit cost.

MISSION PROFILE. A description of the operational requirement(s) that a system must complete to accomplish a particular mission or set of missions. A description of the anticipated mix of ways the new system will be used in carrying out its operational role. It includes expected percentages of time that it will be exposed to each type of environmental/training condition during the system's life. This profile will be used as the basis for mission reliability assessment. The tasks may be multifunctional (an item performing several tasks such as a tank shooting, moving, and communicating); single-function continuous (an item continuously performing one task such as a surveillance radar); single-function cyclic (an item performing the same task repeatedly such as a missile launcher or artillery piece); or single-function, one-time (an item performing only a one-time task such as a missile or munition) and described in terms such as hours, miles, or rounds fired.

MODE OF INSTRUCTION. Method of scheduling materials presentations. The instructional mode may be individualized (self-pacing) or group (block scheduling).

NEW EQUIPMENT PERSONNEL REQUIREMENTS SUMMARY (NEPRS). A compilation of individual summaries for new or improved materiel under development by the Army. Each summary presents the personnel (qualitative and quantitative), training, and organizational implications of the system involved.

NEW EQUIPMENT TRAINING (NET). Training which provides for the initial transfer of system/equipment/component technical information from the materiel developer to key military and government personnel.

NEW EQUIPMENT TRAINING TEST SUPPORT PACKAGE (NETTSP). An assemblage of training requirements (instructors, training devices, plans of instructions, instruction manuals, and training facilities) for the training of school cadre and operational and maintenance personnel for system testing (where possible the school cadre will train operating and maintenance personnel). Also included is a plan for the collection and evaluation of the adequacy of the personnel training.

NONCOMBAT DEVELOPMENT ITEM. A new item of equipment, developed and/or procured in response to an approved materiel requirement document, not

intended for use in a theater of operations or for control of civil disturbances.

NONDEVELOPMENT PROGRAMS. Items or systems available for procurement with no expenditure of RDTE funds.

NONDEVELOPMENTAL ITEM. Items available for procurement with no expenditure of Army Research, Development, Test, and Evaluation (RDTE) funds. Non-developmental items will undergo test and evaluation (or on-site operational test/evaluation, for directed procurement items and items to be procured in small quantities) prior to type classification STANDARD (LCC A).

NON-MAJOR SYSTEMS. Those systems which do not meet the criteria for designation as major systems.

NONPERFORMER. An individual who cannot perform a designated task under specific conditions to a specified performance standard.

NONSYSYTEM DEVICES. Nonsystem training devices are developed to support general military training, training on more than one item/system, or several different types of equipment. These devices may be developed, funded, and procured by either the appropriate materiel developer or trainer.

OBJECTIVE FORCE PLANNING. Planning to develop forces required within a specified time frame to accomplish the national security objective; addresses division forces and their support.

ON-SITE USER TESTING (OSUT). Testing performed to insure that certain items or systems that are not being acquired for the Army in the field are ready for operational use. OSUT has objectives similar to DT III and OT III but is conducted on equipment at the operational site.

OPERATIONAL CAPABILITY OBJECTIVE (OCO). A DA-approved description of an operational capability desirable of achievement in a specified time period, ten or more years in the future, the technical feasibility of which has not been proven. New objectives will be promulgated as Science and Technology Objectives (STO) and will be listed in the Science and Technology Grids (STOG).

OPERATIONAL CHARACTERISTICS. Those military characteristics which pertain primarily to the functions to be performed by equipment either alone or in conjunction with other equipment (e.g., for electronic equipment, operational characteristics include such items as frequency coverage, channeling, type of modulation, and character of emission).

OPERATIONAL EVALUATOR. The designated operational tester (the command or agency responsible for operational testing (OT)), or a subordinate

element, which prepares the OT independent evaluation; provides the chairman for OT reliability, availability, and maintainability (RAM) scoring conferences and data aggregation meetings; and provides a principal spokesperson at all RAM scoring conferences and meetings. Operational evaluators include: the Operational Test and Evaluation Agency (OTEA); TRADOC Systems Analysis Agency (TRASANA); TRADOC schools and centers; US Army Communications Command (USACC) and Communications Electronics Engineering Installation Agency (CEEIA); and The Surgeon General (TSG) (AR 702-3).

OPERATIONAL FEASIBILITY TESTING (OFT). A limited category of FDTE conducted by the user to permit an operational evaluation of systems developed by another service, foreign nation, or a commercial firm, and to provide input for a new Letter of Agreement (LOA), Required Operational Capability (ROC) or Letter Requirement (LR); for modification of an Outline Development Plan (ODP) or Development Plan (DP); or initiation of a Product Improvement Proposal (PIP).

OPERATIONAL TEST CRITERIA. Expressions of the operational level of performance required of the military system to demonstrate operational effectiveness for given functions during each operational test. The expression consists of the function addressed, the basis for comparison, the performance required, and the confidence level.

OPERATIONAL TESTER. That command or agency, as designated by DCSOPS, assigned responsibility for conducting operational testing of items or systems. It derives program and budget information for operational testing (OT); writes OT portion of the coordinated test program (CTP); determines when, where, how, and by whom OT will be accomplished; prepares operational test design plans, conducts or directs the conduct of OT; reports on test results, and provides independent evaluations.

OPERATIONAL TESTING (OT). Testing and evaluation of materiel systems which are accomplished with typical user operators, crews, or units in as realistic an operational environment as possible to provide data to estimate--

- a. The military utility, operational effectiveness, and operational suitability (including compatibility, interoperability, reliability, availability and maintainability, supportability, operational soldier-machine interface, and training requirements) of new systems.
- b. From the user viewpoint, the system's desirability, considering systems already available and the operational benefits and/or burdens associated with the new system.
- c. The need for modification to the system.

- d. The adequacy of doctrine, organization, operating techniques, tactics, and training for employment of the system; the adequacy of maintenance support for the system; and, when appropriate, its performance in a countermeasures environment.

OUTLINE ACQUISITION PLAN (OAP). A development plan prepared prior to entry into the validation phase of the RDTE program. It is prepared by the materiel developer in coordination with the combat and training developer. The OAP will constitute a definitive plan for advanced development and will address follow-on actions only to the degree that is practicable. In conjunction with the letter of agreement (LOA), the OAP is a document of record to support the advanced development effort and supports the LOA by providing a plan for management of the RDTE effort to achieve the materiel objective addressed by the LOA (AR 70-27).

OUTLINE DEVELOPMENT PLAN. See Outline Acquisition Plan.

OUTLINE TEST PLAN (OTP). The formal document included in the FYTP which contains appropriate administrative information; the test purpose, objective, scope, and tactical context; resource requirements; and cost estimates (AR 70-10).

PERFORMANCE-BASED ITEMS. Questions in the Written Component of the SQT, the responses to which are based on the examinee's knowledge of correct performance of the task even though the examinee does not have to actually perform the task in order to answer the questions.

PERFORMANCE CERTIFICATION COMPONENT (PCC). That part of an SQT (if used) that, like the Hands-on Component evaluates tasks which require use of cognitive manipulative, or other motor skills, but which are not included in the HOC simply because they are too expensive in terms of time, equipment, personnel, and/or other resources.

PERFORMANCE CRITERIA. The operational and/or functional capabilities established for an item of materiel at the time it is approved for development. These criteria are usually stated as essential characteristics in the ROC.

PERFORMANCE EVALUATION. The gathering of data to specifically determine the success of students on a specific task, as a results of a training program.

PERFORMANCE MEASURES. The absolute standard by which a job performance is judged. A performance measure is the inventory of job tasks with each performance objective.

PERFORMANCE STANDARDS (TASK). See Task Standard.

PERSONNEL AND TRAINING. Personnel in the numbers and with the necessary skills required to operate and support a materiel system in its operational environment. The processes, procedures, training equipment, training aids and devices, and training programs used to train personnel in the operation and support of a materiel system (AR 700-127).

PHASE. A major stage or segment of the total life cycle. Five such life cycle phases have been defined by this regulation as follows: Conceptual, Validation, Full-scale Development, Production, and Operational and Disposal.

PHYSICAL SKILLS. Specified muscular activities for accomplishing a goal.

PLANNING ESTIMATE. The estimates of operational/technical characteristics, schedule, and program acquisition cost for both development and procurement when approval is granted for program initiation (DODI 5000.3).

PREPRODUCTION PROTOTYPES. Those engineering development prototypes manufactured for OT and DT III prior to full production. They could also be the prototypes tested in OT and DT II.

PRODUCT IMPROVEMENT TESTING. Testing to insure suitability of the proposed product improvement for Army use.

PRODUCTION AND DEPLOYMENT PHASE. The fourth phase of the materiel life cycle. During this phase, operational units are trained, equipment is procured to meet the authorized acquisition objective (AAO) and distributed in accordance with the major item distribution plan (MIDP), and logistical support is provided. Product improvements are applied to the equipment and/or support systems when they are required by operational experience or to employ new technology and doctrine. A table of organization and equipment (TOE), table of distribution and allowances (TDA), and common table of allowance (CTA) are refined or modified as required.

PROGRAM MEMORANDA. There are two types of program memoranda: Defense Program Memoranda (DPM) and Army Program Memoranda (APM). DPM are similar to DCP; however, DPM serve to provide DDRE control of programs or aggregations of minor programs that do not qualify as OSD major systems for DCP/DSARC management. The ASARC will develop the Army position on DPM when such programs are designated as major Army programs. When a DPM is required for other programs, the CRDA will develop the Army position. Upon Secretary of Army approval, or as

delegated by the Secretary, the Army position will be provided DDRE through channels established for coordinating such documents. Army Program Memoranda (APM) will be approved for HQDA by the ASARC Chairman (VCSA) after ASARC review. APM will provide direction for programs which the Army has designated as major and which do not come under either DCP or DPM management control.

PROGRAMMED INSTRUCTION. Instructional materials which present subject matter in a series of small sequential units which require responses from the student.

PROJECT MANAGEMENT OFFICE (PMO). The organization comprised of personnel assigned full-time to PM. The PMO may be augmented with additional personnel from participating organizations when provided for in the charter (AR 70-17).

PROJECT MANAGER (PM). An individual chartered by the Secretary of the Army, who is assigned the responsibility and is delegated the full line authority for the centralized management of a specified development/acquisition project.

PROJECT MANAGER CHARTER. The document approved and issued by authority of the Secretary of the Army that establishes a project manager and his management office, defines his mission, authority, and major functions, describes his relationships with the Army staff, the major commands, and other services and Government agencies, as appropriate, and specifies the support to be provided him and his office by each participating organization (AR 70-17).

PROJECT SYSTEM. Equipment and skills, together with any related facilities, services, information, and techniques, that form a complex or an entity capable of performing specific operational tasks in support of a specified DOD/DA objective (AR 70-17).

PROJECT/SYSTEM MANAGEMENT. A concept for the technical, financial, and administrative management of specified development/acquisition programs based on the use of designated, centralized management authority. This authority is responsible for planning, organizing, directing, and controlling all phases of research, development, initial procurement, production, distribution, and logistical support for the purpose of providing a balanced program to accomplish the stated program objectives. He is also responsible for assuring that planning is accomplished and action is implemented by the organizations responsible for the complementary functions of evaluation, logistic support, personnel, training, operational testing, activation, and deployment. The centralized management authority is supported by functional organizations which are responsible for the execution of specifically assigned tasks (AR 70-17).

PROJECT TRANSITION. The period within the project management cycle during which the PM relinquishes management direction and control over specific functions to a system support manager or a product manager (AR 70-17).

PROPOSER. An Army organization or staff which has been assigned primary responsibility for materiel or for subject matter in its area of interest (e.g., a proposer school, proposer staff agency, or proposer center).

PROPOSER SCHOOL. The TRADOC school designated by CG, TRADOC, to exercise supervisory management of all combat/training development aspects of a materiel system.

PROPOSER (Training). A TRADOC organization, normally a school, which has been assigned primary responsibility for combat development functions relating to a new materiel item in its area of interest.

PROTOTYPE QUALIFICATION TEST (PQT). The test or series of tests at the component, subsystem, or system level that are contractually stipulated to be conducted so as to demonstrate that contract requirements have been essentially met and that the developer can have a high level of confidence that DT II will be successful.

PROVISIONAL QPPI. The materiel developer's initial compilation of available new equipment data. The Provisional QPPI is used for advanced planning and preparation of Basis of Issue Plan I (BOIP I) development (AR 71-2 and DA Pamphlet 11-25).

QUALITATIVE AND QUANTITATIVE PERSONNEL REQUIREMENTS INFORMATION (QPPI). A compilation of specified organizational, doctrinal, training, and personnel information developed by a materiel development agency (specified in AR 71-5), in coordination with the combat developer and trainer for a new or improved materiel system. This information is used to determine the need for establishment or revision of an MOS/SSI and to prepare plans to provide the numbers of trained personnel required to operate and support the new or improved materiel system. See also, Provisional QPPI, Final QPPI.

RATIONALIZATION. Any action that increases the effectiveness of Alliance forces through more efficient or effective use of defense resources committed to the Alliance. Rationalization includes consolidation, reassignment of national priorities to higher Alliance needs, standardization, specialization, mutual support, improved interoperability or greater cooperation. Rationalization applies to both weapons/materiel resources and non-weapons military matters.

RELIABILITY, AVAILABILITY, AND MAINTAINABILITY (RAM). RAM requirements will be established for materiel systems based upon operational

requirements, projected state of the art, and life cycle cost. RAM is a design characteristic which will be managed as a system performance parameter throughout the acquisition cycle. RAM performance will be determined by test and evaluation and an assessment of RAM will be considered at milestone decision points (see AR 702-3).

REQUIRED OPERATIONAL CAPABILITY (ROC). A HQDA approved document which states concisely (normally in four pages or less) the minimum essential operational, technical, logistical, and cost information necessary to initiate full-scale development or acquisition of a materiel system (AR 71-9).

REQUIREMENTS DOCUMENTS. There are two types of Requirements Documents.

- a. Acquisition documents requiring preparation of and support by a BOIP. Examples are Required Operational Capabilities (ROC), Letter Requirements (LR), Training Device Requirements (TDR), Training Device Letter Requirements (TDLR), and Letters of Agreement (LOA).
- b. Tables of Organization and Equipment (TOE). A table which prescribes the normal mission, organizational structure, and personnel and equipment requirements for a military unit, and is the basis for an authorizations document.

SAFETY CONFIRMATION LETTER. A letter, separately issued by the development tester to the materiel developer, which states that the item or system conforms to all safety requirements and specifies precisely what those safety requirements are.

SAFETY RELEASE. A document provided by the materiel developer prior to any testing involving the use of troops. Each safety release will express the specific hazards of the item or system and will include technical and operational limitations and precautions (AR 385-16).

SAFETY STATEMENT. A formal, comprehensive safety report that summarizes the safety data that has been collected and evaluated during the life cycle before a test of an item. It expresses the considered judgment of the developing agency regarding the hazard potential of the item and any actions or precautions that are recommended to minimize these hazards and to reduce the exposure of personnel and equipment to them.

SCENARIO. An HQ TRADOC- and HQDA-approved scenario to be used for a baseline assessment of current forces and as a test vehicle to evaluate proposals for changes to Army forces and doctrine. A scenario includes the general and operational scenarios, including scenario

guidance, general scenario, operational scenario, study scenario, scenario oriented, recurring evaluation system.

SELF-TEACHING EXPORTABLE PACKAGES. Self-instructional study units; generally sent to the student wherever he is stationed.

SIMULATORS. Machines or processes designed to provide training which will have high positive transfer to the real world equipment or situation. Simulators are ordinarily cheaper, safer, or more available than the actual situation or equipment.

SKILL LEVEL (SL). One of five levels of proficiency of an MOS under Enlisted Personnel Management System (EPMS). A level of proficiency under which specific military jobs are grouped; the level of proficiency at which an individual qualifies or verifies in an MOS.

SKILL PERFORMANCE AID (SPA). (a) A systematic approach to developing technical documentation and training. The key features are: (1) the systematic analysis of the equipment to identify all performance tasks; (2) the analysis of all tasks to develop step-by-step performance procedures; (3) the development of fully proceduralized and soldier-tested manuals; (4) the identification of performance tasks which require supplementary training; and (5) the development of lesson and training management materials to directly support the technical manual. Following the validation and verification of all materials, the technical manual becomes the primary resource of all training. The TM is the primary reference source for using the training materials. (b) Includes requirement for a front-end analysis (FEA) (i.e., task analysis, equipment analysis, functional analysis, behavioral task analysis). (c) A support package which enables Army units to receive, use, and maintain equipment with a minimum of outside technical assistance and outside training support. Training is restricted to the teaching of equipment specific task sequences, plus the use of the technical manual which is the basic reference.

SKILL QUALIFICATION TEST (SQT). A job-oriented, criterion-referenced test designed to measure the soldier's ability to perform the critical tasks required by the job. It is used to assess task competence for training feedback and overall job competence for personnel management purposes.

SOLDIER'S MANUAL (SM). A book that lists for the soldier those critical tasks needed to be satisfactorily performed to be judged proficient at a given skill level of an MOS. The soldier must be able to perform all the critical tasks listed for that skill level AND the critical tasks for the lower skill levels of the MOS which are still part of the job at the higher skill level. In addition, the SM outlines for the soldier how to perform the tasks, the typical conditions under

which they will be performed, and the standards which must be met. Where greater detail is required in the performance steps, the soldier is referred to other Army publications as additional references. Only tasks found in the SM may be tested in the SQT.

SPECIAL STUDY GROUP (SSG). A group, normally composed of representatives of HQDA, combat developer, operational tester, materiel developer, logistician, and trainer, and the project manager designee, which is convened to conduct analysis, insure inclusion of all alternatives within an analysis, monitor experimentation, or undertake other such tasks that may require the concentration of special expertise for a short duration (AR 71-9).

SPECIAL TASK FORCE (STF). A group that is normally composed of the chartered task force director and representatives of the user, materiel developer, trainer, combat developer, HQDA, and operational tester, and the project manager designee. This task force conducts an in-depth investigation of the need for the system described in the requirements documents and of any necessary alternative system designs, monitors experimentation, and arrives at a recommended approach to provide the system described in an approved ROC document (AR 71-9).

SPECIALIZATION. An arrangement within an alliance wherein a member or group of members most suited by virtue of technical skills, location, or other qualifications assume (s) greater responsibility for a specific task or significant portion thereof for one or more members.

SPECIFICATION. A document intended primarily to identify items and used in procurement to clearly and accurately describe the essential technical requirements for items, materials or services being purchased. Preparation instructions are included in MIL-S-83490 (AR 70-37).

SQT DEVELOPER. A person engaged in writing, preparing, and validating SQT at the service school. The SQT developer will be preparing tests for a number and variety of tasks. During development, it is necessary to make use of job and subject matter experts. These individuals are generally available within the service school, either as co-workers or workers within other departments.

SQT PLAN. A document that serves as the general outline of how a MOS will be tested. It includes the MOS to be tested, the SQT number, MOS population and rationale for task selection. It also identifies the tasks to be tested by component, number of skill units by skill level, and lists equipment, ammunition, simulators and/or devices required to be used during testing.

STANDARDIZATION. The process by which member nations achieve the closest practicable cooperation among forces; the most efficient use

of research, development, and production resources; and agree to adopt on the broadest possible basis the use of: (a) common or compatible operational, administrative, and logistics procedures; (b) common or compatible technical procedures and criteria; (c) common, compatible, or interchangeable supplies, components, weapons, or equipment; and (d) common or compatible tactical doctrine with corresponding organizational compatibility.

STORYBOARD. A collection or series of small pictures which describe the action and content that will be contained in an audiovisual or visual only production. A sequence of these small pictures comprises a storyboard.

STRUCTURE AND COMPOSITION SYSTEM (SACS). A system which relates Force Accounting System (FAS), The Army Authorization Documents System (TADDs), Basis of Issue Plans System (BOIPS), and Table of Organization and Equipment (TOE) System Data bases into one computation. The major output of SACS is the complete detailed requirements or authorizations for any given force. The personnel requirements are given by grade, branch, and MOS for both authorized and required strengths. The equipment for both required and authorized items is expressed by LIN. These personnel and equipment requirements are for each unit in the designated force.

SUBJECT MATTER EXPERTS (SME). An individual who has a thorough knowledge of the task to assist in review of task analysis, to answer questions during development of the SQT, and may be tasked to develop items.

SUITABILITY. A subjective determination by a decision authority that developmental materiel does or does not meet minimum essential standards prerequisite to satisfactory field service use. The judgment may be based on the presence or absence of uncorrectable materiel deficiencies, and/or the number and assessed importance of correctable and uncorrectable shortcomings.

SUPERVISED ON-THE-JOB TRAINING (SOJT). Training which is accomplished while an individual is working in a particular duty position and which is closely monitored by the soldier's supervisor because of equipment, safety, or skill requirements.

SURETY. Those requirements which ensure that the system meets its performance requirements and remains operationally effective, within specified parameters despite the threat of enemy exploitation, through either deliberate attack or inadvertent system degradation.

SYSTEM. Fielded system--any system currently in the active inventory that has been type classified or exempted from same. Developmental system--and system currently in the acquisition process.

SYSTEM DEVICE. System training devices are those developed in support of a specific item/system. They are designed for use with only that system or item or equipment, including subassemblies and components. It is the responsibility of the item/system project manager or appropriate materiel developer to develop, fund, and procure a device concurrent with the parent system/item (DA Pamphlet 11-25) or to fill a training void for items/systems already fielded.

SYSTEM MANAGER (SM). An individual chartered by the Secretary of the Army who is assigned the responsibility, and delegated full-line authority for the centralized management of a specific program.

SYSTEM SUPPORT MANAGER (SSM). A commodity commander, designated by the head of the responsible developing or procuring agency, who is responsible for providing primary and continuing support to the project system manager during the development phase, acting as the point of contact with logistical support agencies and assuming responsibility over the system following final acceptance for use by DA and termination of project management (AR 70-17).

SYSTEM ANALYSIS. An objective and systematic approach designed to help a decision-maker choose a course of action. Using the techniques of management analysis, this approach defines the full problem, searches out objectives and alternatives, and compares them in light of their consequences.

SYSTEMS APPROACH. A generic term referring to the orderly process of analysis, design, development, evaluation, revision, and operation of a collection of interrelated elements.

TARGET POPULATION. The pool of potential entrants to training for which instructional materials are designed and tried out.

TASK. An act, or series of acts, performed by an individual to produce a product or achieve a certain result. It is the lowest level of behavior in a job that describes the performance of a meaningful function in a job. A task has an intermediate action that can be specifically stated in terms of behavioral activities. Tasks vary in complexity. The degree of specificity may be imprecise, and what appears to be a very simple task may be treated more meaningfully as part of a larger task. Conversely, what appears to be a complex task may be meaningfully broken into two or more component tasks. A group of tasks goes together to form a job or duty position.

TASK ANALYSIS. The function involved to identify the skills and knowledge needed to enable a soldier to perform each task. It includes: conditions of performance; equipment and tools required; actions performed (divided into steps, elements, or behaviors); and the standard

for products, results, or outcomes. Following job analysis, task analysis is the basis for all developmental work on the SQT.

TASK CONDITIONS. Description of the necessary equipment and physical setting under which the soldier is required to accomplish the specified task on the job. Conditions describe the important aspects of the performance environment.

TASK DELAY TOLERANCE. A measure of how much delay can be tolerated between the time the need for task performance becomes evident and the time actual performance must begin.

TASK ELEMENTS. The behaviors or steps in a task. They are initially identified in the task analysis. If it appears that task elements need to be added, it is advisable to coordinate with those who do the task analysis. The task analysts are responsible for adding the appropriate steps or task elements.

TASK INVENTORY. List that itemizes all of the tasks that make up a selected duty.

TASK LEARNING DIFFICULTY. Refers to time, effort, and assistance required by a student to achieve performance proficiency.

TASK LIMIT (BOUNDARY). The cues in the job situation which mark the beginning and ending points of the task.

TASK STANDARD. A statement of how well a task must be performed. The standard specifies how well, completely or accurately a process must be performed or product produced, under the task conditions. The standard reflects task requirements on the job or in the test. If it is a product standard, it is expressed in terms of sequence, completeness, accuracy, or speed. Both product and process standards must be observable and measurable.

TASK STATEMENT. A statement of highly specific action which has a verb-object-qualifier format. For example, "Sort the letter mail."

TECHNICAL FEASIBILITY TESTING (TFT). Technical feasibility testing is the responsibility of the materiel developer and provides test data for a technical evaluation and assessment of items/systems developed by another service, foreign nation, or commercial firm. The results of this type testing may provide input for a new letter requirement (LR), LOA, or ROC, modification of a development plan, or the initiation of a product improvement program (PIP). TFT may be evaluated by the decision review as qualifying for DT I.

TEST. A process by which data are accumulated to serve as a basis for assessing the degree that a system meets, exceeds, or fails to meet the technical or operational properties ascribed to the system.

TEST COMMAND OR AGENCY. The command or agency that is responsible for the test or test management.

TEST CONTROL OFFICER (TCO). The individual responsible for the administrative functioning of SQT in the field. The TCO is the point of contact between the field and Individual Training and Education Directorate (ITED). In TRADOC all TCOs are assigned within the operations staff section (DPT, G3); in some commands, TCOs may be in the administrative staff section (DPCA, G1, AG).

TEST DESIGN PLAN (TDP). A formal document approved by the test organization which states the circumstances under which a test is executed, the data required from the test, and the means of analyzing test data.

TEST DIRECTORATE. A temporary organization formed to conduct a test. User test directorates have a test director, deputy directors, and other test personnel designated in an approved plan. A deputy test director (for DT or OT) directs elements of the test directorate executing data collection, test control, and analysis. Other deputies and elements of a test directorate may be concerned with test troops, system support, supervision of combat development concepts employed in the test, training, logistics, facilities, administration, and advisory and monitoring personnel.

TEST OBJECTIVE. Some of the purposes for which the test is conducted embodying a logically related set of test-answerable and interdependent issues. The objective implies the scope of the inquiry.

TEST ORGANIZATION. The organization responsible for conducting the testing (e.g., OTEA, contractor team, laboratory group, test boards, or proving ground directorate).

TEST PROPONENT. The command or agency, as designated by HQDA, which has been assigned the primary responsibility for testing of materiel systems or concepts and/or requiring test results.

TEST REPORT. A document that contains the data obtained from executing the test, describes the conditions that actually prevailed during testing and data collection, and contains an analysis of test results versus test objectives.

TEST SCHEDULE AND REVIEW COMMITTEE (TSARC). A DA committee which recommends test priorities; coordinates resources for support of user testing; resolves conflicts between test requirements and other missions; and recommends approval of the FYTP.

TEST SUPPORT UNIT. The command or agency that supports a test by providing military personnel and TOE units and a portion of the operational test directorate.

TEST UNIT. The TOE unit or individuals designated for the test.

TESTER. The agency responsible for the developmental testing (DT) or operational testing (OT) of materiel. DT is planned, conducted and monitored by the materiel developer. All OT is the responsibility of and is managed by OTEA. OT is normally conducted by OTEA for major and selected non-major systems, and by TRADOC, ASA, TSG or other operational testing for other non-major systems.

THREAT SUPPORT PACKAGE. A statement of the actual expected threat for the tested system. It may also contain specially constructed threat hardware.

TOTAL SYSTEM. The term "total system" encompasses all system elements which must be considered in analysis, testing, and development during the materiel acquisition process. These elements include materiel (hardware), tactical employment (organization), manpower (training, management, replacement), and logistical support (maintenance, supply, transportation).

TRADE-OFF ANALYSIS (TOA). A document prepared by a Special Task Force or Special Study Group or jointly by the combat and materiel developers to determine which technical approach(es) offered in the TOD are best.

TRADE-OFF DETERMINATION (TOD). The document prepared by the materiel developer and transmitted to the combat developer or to a STF or SSG to convey the apparent technical feasibility of a potential system, including technical risks associated with each approach, estimated RDTE, and procurement costs and schedules.

TRADOC SYSTEM MANAGER (TSM). The TSM is the user representative in the development and deployment of his system. He influences the process by sensing, coordinating, and facilitating all actions associated with his system. He is an energizer, organizer, integrator, and expeditor. He is the TRADOC counterpart of the DARCOM PM and is appointed by CG, TRADOC.

TRAINER. The agency responsible for the conduct of the training which will provide the necessary skills to operate and maintain items/equipment/systems.

TRAINING. The teaching of job skills. It can take a number of forms such as self-teaching exportable packages, training manuals, individual learning packages, formal on-the-job training, or group training.

TRAINING DEVELOPER. The agency responsible for development of the training strategy and requirements for both institutional and unit training.

TRAINING DEVICES. Any three-dimensional object developed, fabricated, or procured specifically for improving the learning process. May be either system or non-system devices. System devices are designed for use with one system or item of equipment, including subsystems and components. Non-system devices are designed to support general military training and/or for use with more than one system or item of equipment.

TRAINING DEVICE REQUIREMENT (TDR). A document prepared by TRADOC which gives operational, technical, and cost information relative to a training device requirement necessary to obtain HQDA approval.

TRAINING EQUIPMENT. Items of equipment, or their components, such as rifles, vehicles, aircraft, motion picture projectors, engine and test equipment. Although used for training, they do not lose their identity as end items and therefore are not training devices.

TRAINING SETTING CRITERIA. In media selection, the options that training must be either small group, large group, individualized at a fixed location, or individualized independent of location.

TRAINING TEST SUPPORT PACKAGE. Used to train user troops for testing and to plan data collection in the area of training requirements.

TYPE CLASSIFICATION. Identifies the life cycle status of a materiel system by the assignment of a type classification designation and records the status of a materiel system in relation to its overall life history as a guide to procurement, authorization, logistical support, assets and readiness reporting (AR i71-6).

TYPICAL USER TROOPS. User operators, crews, or units of the type and qualifications of those expected to use and maintain the system when it is deployed.

USER. The command, organization, or unit designated to receive the materiel system from production for use in accomplishing a designated mission. The materiel system is included in the user's TGOE, TDA, or in an appropriate CTA. The user provides guidance to materiel and combat developers during the materiel acquisition process on matters pertaining to the expected operational employment and logistic support. (The designated "user representative" normally acts as the user during the materiel acquisition process.)

USER REPRESENTATIVE. The combat developer designated to represent the user during the materiel acquisition process. The user representative accomplishes this by ascertaining the needs of the user in order to influence constructively the design of the materiel system and to insure that new or appropriate product-improved materiel

systems meet those needs. The command or agency filling this role represents the "mission-oriented" user and the "logistics-oriented" user by concerning itself with both the operational and logistic support aspects of materiel systems.

USER TESTING. A generic term encompassing operational testing (OT) and force development testing and experimentation (FDTE).

UTILITY. The military or operational value of an item or system when measured from within a pertinent Army Concept Program and against the threat analysis and future concept, doctrine, environment, organization, skills, availability, reliability, maintainability, obsolescence, and other materiel objectives/requirements.

VALIDATION. (a) General: Testing instructional materials after course development to ensure that the materials are effective and the students are mastering the learning objectives. (b) Evaluation: The process of trying out an evaluation instrument to determine its effectiveness in measuring performance as required on the job. This effectiveness is usually expressed in terms of the correlation coefficient between scores on the instrument and scores on a criterion of proficiency in the job or in the training situation. (c) SPA: The process of confirming technical accuracy of content, for completion of requirements set by tasks for training, for readability and writing style. (d) Surveys: The act of confirming questions in a survey instrument as being relevant to the purpose of the survey.

VALIDATION PHASE. The second phase in the materiel life cycle. This phase consists of those steps that are necessary to resolve or minimize special logistic problems identified during the conceptual phase, verify preliminary design and engineering, accomplish necessary planning, fully analyze trade-off proposals, and prepare contracts as required for full-scale development. The validation phase may include the use of advanced development prototypes in development and operational tests. The validation process may be conducted using competitive or single contractors or by in-house laboratories.

VALIDATION PROCEDURE/PROCESS. A set of steps followed to ensure that the test accurately and reliably measures soldier proficiency.

VALUE ENGINEERING. Refers to the process of designing equipment or instruction to meet but not exceed the required outcomes. Ordinarily, it refers to the elimination of features or instructional objectives that have not been demonstrated to be positively necessary.

WAIVER. A written authorization to accept a configuration item or other designated items, which during production or after having been submitted for inspection, are found to depart from specified require-

ments, but nevertheless are considered suitable for use "as is" or after rework by an approved method.

WRITTEN COMPONENT (WC). That part of the SQT which requires the examinee to make decisions or demonstrate mental abilities.

WRITTEN PERFORMANCE ITEM. A task in the WC of the SQT which is characterized by the fact that the correct answer cannot be recognized without first requiring the examinee to actually perform a portion of the task.

WORK ELEMENTS. The element is the smallest component in the structure of a job. Elements combine to form a task, tasks combine to form a duty, and duties combine to form a job.

APPENDIX B

ABBREVIATIONS AND ACRONYMS

AAO	Authorized Acquisition Objective
ACC	Army Communication Center
ACCP	Army Correspondence Course Program
AD	Advanced Development
ADP	Automatic Data Processing
ADPE	Automatic Data Processing Equipment
ADVT-C	Advanced Development Verification Test - Contractor
AFDP	Army Force Development Plan
AMCR	Army Materiel Command Regulation (Predates DARCOM Regulation)
AMDF	Army Master Data File
AMMH	Annual Maintenance Man-Hours
AMSAA	Army Material Systems Analysis Activity
AOP	Additive Operation Projects
AP	Acquisition Plan
APM	Army Program Memorandum
AR	Army Regulation
ARI	Army Research Institute for Behavioral and Social Sciences
ARPRINT	Army Program for Individual Training
ARTADS	Army Technical Data Systems
ARTEP	Army Training and Evaluation Program
ASA	Army Security Agency
ASA	Army Strategic Appraisal
ASARC	Army Systems Acquisition Review Council

ASI	Additional Skill Identifier
ASPR	Armed Services Procurement Regulation
ATE	Automatic Test Equipment
ATLP	Army-wide Training Literature Program
ATP	Army Training Program
ATSC	Army Training Support Center
ATT	Army Training Test
BCE	Baseline Cost Estimate
BII	Basic Issue Item
BITE	Built-In Test Equipment
BOC	Best Operational Capability
BOI	Basis of Issue
BOIP	Basis of Issue Plan
BOIP I	(See TBOIP)
BOIP II	(See FBOIP)
BOIPC	Basis of Issue Plan - Complete, FBOIP
BOIPT	Basis of Issue Plan - Tentative, TBOIP
BTA	Best Technical Approach
CA	Concept Approval
CAA	Concepts Analysis Agency
CACDA	Combined Arms Center Development Agency
CADTDR	Commercially Available/Fabricated Training Device Requirement
CAI	Computer-Assisted Instruction
CARDS	Catalog of Approved Requirements Documents
CBB	Configuration Control Board
CD	Combat Developments/Developer

CDEC	U.S. Army Combat Developments Experimentation Command
CDRL	Contractor's Data Requirements List
CEP	Concept Evaluation Program
CFP	Concept Formulation Package
CM	Commander's Manual
CM	Configuration Management
CMI	Computer-Managed Instruction
CNDI	Commercial Non-Developmental Item
CHETP	Consolidated New Equipment Training Plan
COA	Comptroller of the Army
COBE	Command Operating Budget and Estimate
COEA	Cost and Operational Effectiveness Analysis
CONOPS	Continuity of Operations
CONUS	Continental United States
CSA	Chief of Staff, US Army
CTA	Common Table of Allowance
CTEA	Cost and Training Effectiveness Analysis
CTP	Coordinated Test Program
D, PA & E	Director, Program Analysis and Evaluation
DA	Department of the Army
DAAPP	Department of the Army Audiovisual Production Program
DARCOM	U.S. Army Development and Readiness Command
DASC	Department of the Army System Coordinator
DASTF	Department of the Army Special Task Force
DATA	Drawing for Army Training Aids
DCD	Decision Coordination Document

DCD	Directorate of Combat Development
DCP	Decision Coordinating Paper
DCP	Development Concept Paper
DCRSD	Directorate of Course Development
DCS	Defense Communications System
DCSCD	Deputy Chief of Staff for Combat Development
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff for Operations
DSCPER	Deputy Chief of Staff for Personnel
DCSRDA	Deputy Chief of Staff for Research, Development and Acquisition
DCST	Deputy Chief of Staff for Training
DDRE	Director of Defense Research and Engineering
DEP	Draft Equipment Publications
DEVA IPR	Development Acceptance In-Process Review
DFAE	Director of Facilities Engineering
DID	Data Item Description
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DOTSP	Doctrinal and Organizational Test Support Package
DP	Development Plan (now Acquisition Plan)
DPM	Defense Program Memorandum
DRA	Decision Risk Analysis
DS	Direct Support
DSARC	Defense Systems Acquisition Review Council
DST&DD	Developing Systems Training and Devices Directorate

DT	Developmental Test/Testing
DTD	Directorate of Training Development
DTP	Detailed Test Plan
DT/OT	Development Test/Operational Test
DTC	Design to Cost
DTP	Detailed Test Plan
DVAL	Demonstration and Validation
EARA	Equipment Authorization Review Agency
ECM	Electronic Countermeasures
ECP	Engineering Change Proposal
EDT	Engineer Design Tests
EEA	Essential Elements of Analysis
EIA/EIS	Environmental Impact Assessment/Statement
EIALC	Environmental Impact Assessment for Life Cycle
EIR	Equipment Improvement Recommendation
ESC	Equipment Serviceability Criteria
ESM	Electronic Security Measures
ET	Embedded Training
ETM	Extension Training Material
EW	Electronic Warfare
FBOIP	Final Basis of Issue Plan
FCA	Functional Configuration Audit
FD/SC	Failure Definition and Scoring Criteria
FDTE	Force Development Testing and Experimentation
FEA	Front-End Analysis
FFD	Functional Flow Diagram
FISOI	Force Integration Staff Officer

FM	Field Manual
FOE	Follow-On Evaluation
FORSCOM	U.S. Army Forces Command
FQQPRI	Final Qualitative and Quantitative Personnel Requirements Information
FSED	Full-Scale Engineering Development
FUE	First Unit Equipped
FYTP	Five-Year Test Program
GFE	Government Furnished Equipment
GFM	Government Furnished Material
GS	General Support
HEL	Human Engineering Laboratory
HQDA	Headquarters, Department of the Army
HRN	Human Research Need
ICT	Individual and Collective Training
ICTP	Individual and Collective Training Plan
IE	Independent Evaluation
IEP	Independent Evaluation Plan
IER	Independent Evaluation Report
I&KP	Instructor and Key Personnel
ILS	Integrated Logistic Support
ILSM	Integrated Logistic Support Manager
ILSMM	Integrated Logistic Support Management Model

IOC	Initial Operational Capability
IPCE	Independent Parametric Cost Estimate
IPR	In-Process Review
IPS	Integrated Personnel Support
IRTP	Initial Training and Recruiting Plan
ISD	Instructional System Development
ISP	Integrated Support Plan
ITDT	Integrated Technical Documentation and Training (now SPA)
ITP	Individual Training Plan
JB	Job Book
JPA	Job Performance Aid
JPG	Job Performance Guide
JPM	Job Performance Manual
JSOR	Joint Service Operational Requirement
JTA	Joint Table of Allowances
JTB	Job Training Book
JTP	Job Training Package
JWG	Joint Working Group
KIPT	Key Instructor and Personnel Training
LAO	Logistics Assistance Office
LCSMM	Life Cycle System Management Model
LEA	Logistics Evaluation Agency
LLI	Long Lead Time Item
LOA	Letter of Agreement

LOG	Logistician
LOGCAP	Logistic and Command Assessment of Projects
LOGCEN	U.S. Army Logistics Center
LOI	Letter of Instruction
LP	Lesson Plan
LR	Letter Requirement
LRIP	Low-Rate Initial Production
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Record
LSP	Logistic Support Plan
MAC	Maintenance Allocation Chart
MACI	Military Adapted Commercial Item
MACOM	Major Army Command
MACRIT	Manpower Authorization Criteria
MADP	Materiel Acquisition Decision Process
MAP	Materiel Acquisition Process
MD	Materiel Developer
MENS	Mission Element Needs Statement
MFP	Materiel Fielding Plan
MFT	Materiel Fielding Team
MIDA	Major Item Data Agency
MIDP	Major Item Distribution Plan
MILPERCEN	U.S. Army Military Personnel Center
MIL-STD	Military Standard
MMC	Army Maintenance Management Center

MMC	Army Maintenance Management Center
MMT	Manufacturing Methods and Technology
MOA	Memorandum of Agreement
MOS	Military Occupational Specialty
MOSC	Military Operational Specialty Code
MOU	Memorandum of Understanding
MR	Materiel Readiness
MSO	Materiel Status Office
MSP	Maintenance Support Plan
MRSA	Materiel Readiness Support Activity
MTBF	Mean Time Between Failures
MTBM	Mean Time Between Maintenance
MTDA	Mobilization Table of Distribution and Allowances
MTOE	Modification Table of Organization and Equipment
MTSP	Maintenance Test Support Plan
MTTR	Mean Time to Repair
MWO	Modification Work Order
NEPRS	New Equipment Personnel Requirements Summary
NET	New Equipment Training
NETP	New Equipment Training Plan
NETT	New Equipment Training Team
NETTSP	New Equipment Training Test Support Package
NMIL	New Materiel Introduction Letter
NMIT	New Materiel Introduction Team

OAP	Outline Acquisition Plan
OC	Operational Concept
OCO	Operational Capability Objective
ODP	Outline Development Plan (now Outline Acquisition Plan)
OICTP	Outline Individual and Collective Training Plan
OJT	On-the-Job Training
OMA	Operation and Maintenance, Army
OPFOR	Opposing Force Program/Opposition Force
O&S	Operation and Support
OSA	Office, Secretary of the Army
OSD	Office of the Secretary of Defense
OSUT	On-Site User Test/Testing
OT	Operational Test/Testing
OT&E	Operational Test and Evaluation
OTE	Operational Test and Evaluation
OT&A	Operational Test and Evaluation Agency
OTP	Outline Test Plan
OTRS	Operational Test Readiness Statement
PARR	Program Analysis and Resource Review
PCO	Procuring Contacting Officer
PCR	Program Change Request
PCS	Physical Configuration Audit
PDEP	Preliminary Draft Equipment Publication
PDM	Program Decision Paper
PEP	Producibility Engineering and Planning

PI	Product Improvement
PIP	Product Improvement Program/Proposal
PM	Project Manager
PM TRADE	Army Project Manager for Training Devices
PMO	Project Management Office
POC	Point of Contact
POI	Program of Instruction
POM	Program Objective Memorandum
PPBS	Planning, Programming and Budgeting System
PPTP	Personnel Performance and Training Program
PQQPRI	Provisional Qualitative and Quantitative Personnel Requirements Information (See TQQPRI)
PQT	Prototype Qualification Test
PT&ME	Physical Teardown and Maintenance Evaluation
PV	Product Validation
QQPRI	Qualitative and Quantitative Personnel Requirements Information
RAM	Reliability, Availability, Maintainability
R&D	Research and Development
RDTE	Research, Development, Test and Evaluation
RFP	Request for Proposal
ROC	Required Operational Capability
RPSTL	Repair Parts and Special Tool List
SA	Secretary of the Army
SACS	Structure and Composition System

SAG	Study Advisory Group
SAMS	Standard Army Maintenance System
SCORES	Scenario-Oriented Recurring Evaluation System
SCS	US Army Soldier Support Center (formerly ADMINCEN)
SEAR	Summary Engineering Assessment Report
SECARMY	Secretary of the Army
SECDEF	Secretary of Defense
SG	Student Guide
SIGINT	Signal Intelligence
SLS	Student Lesson Sheet(s)
SM	Soldier's Manual
SM	System Manager (TRADOC)
SME	Subject Matter Expert
SOP	Standing Operating Procedure
SOQAS	Statement of Quality and Support
SOW	Statement of Work
SPAs	Skill Performance Aids
SPC	Staff Planner's Course
SQT	Skill Qualification Test
SSA	Source Selection Authority
SSAC	Source Selection Advisory Council
SSEB	Source Selection Evaluation Board
SSG	Special Study Group
SST	Special Skill Indicator
SSM	System Support Manager

STEPS	Simulation and Training Equipment Sources
STF	Special Task Force
STO	Science and Technology Objective
STOG	Science and Technology Objectives Guide
TA	Table of Allowances
TAADS	The Army Authorization Documents System
TAG	The Adjutant General
TAMMS	The Army Maintenance Management System
TASA	Task and Skill Analysis
TASC	Army Training Aids Support Center
TBOIP	Tentative Basis of Issue Plan
TC/TCLAS	Type Classification
TC CON	Type Classification - Contingency
TC LP	Type Classification - Limited Procurement
TC OBS	Type Classification - Obsolete
TC STD	Type Classification - Standard
TCADA	TRADOC Training and Combined Arms Development Activity
TDA	Table of Distribution and Allowances
TDC	Test Design Committee
TDIPR	Test Design In-Process Review
TDLOA	Training Device Letter of Agreement
TDLR	Training Device Letter Requirement
TDP	Test Design Plan
TDR	Training Device Requirement
TDRRC	Training Device Requirement Review Committee

TDS	Training Development Study
TEA	Training Effectiveness Analysis
TEC	Training Extension Course
TECOM	U.S. Army Test and Evaluation Command
TFPG	Task Force Planning Group
TIWG	Test Integration Working Group
TM	Technical Manual
TMDE	Test Measurement and Diagnostic Equipment
TMOS	(Tentative) Military Occupational Specialty
TMG	Training Management Guide
TOA	Trade-Off Analysis
TOC	Technical Orientation Course
TOD	Trade-Off Determination
TOE	Table of Organization and Equipment
TQQPRI	Tentative Qualitative and Quantitative Personnel Requirements Information
TR	Test Report
TRADE	See PM TRADE
TRADOC	U.S. Army Training and Doctrine Command
TRASANA	TRADOC Systems Analysis Agency
TRM	TRADOC Resources Management
TSARC	Test Schedule and Review Committee
TSG	The Surgeon General
TSM	TRADOC System Manager
TSP	Test Support Package
TSP	Training Support Plan.
TSWG	Training and Support Working Group
TTSP	Training Test Support Package

UIC	Unit Identification Code
URS	Unit Reference Sheet
VAL	Validation
VAL IPR	Validation In-Process Review
WBS	Work Breakdown Structure

APPENDIX C

PART 1 - CONSOLIDATED LIST OF REFERENCES

Military Documents

Part 1 of Appendix C contains references to military documents relevant to TSM activities. Those documents followed by an asterisk (*) contain procedural guidance that was used in preparing this handbook.

Department of Defense Directives and Instructions

DODD 3200.11	Use, Management and Operation of DOD Major Ranges and Test Facilities
DODD 3224.1	Engineering for Transportation
DODD 4100.35	Development of Integrated Logistic Support for Systems/ Equipment (with planning guide 4100.35-G)
DODD 4151.16	DOD Equipment Maintenance Program
DODD 5000.1	Major System Acquisition*
DODD 5000.2	Major System Acquisition Process*
DODD 5000.3	Test and Evaluation
DODD 5000.26	Defense Systems Acquisition Review Council (DSARC)*
DODD 5000.28	Design to Cost
DODI 4105.26	Proposal Evaluation and Source Selection
DODI 4151.9	Technical Manual (TM) Management
DODI 5000.2	The Decision Coordination Paper (DCP) and the Defense System Acquisition Review Council

Army Regulations

AR 1-1	Planning, Programming and Budgeting within the Department of the Army
AR 5-5	The Army Study System*
AR 10-4	U.S. Army Operational Test and Evaluation Agency*
AR 10-5	Department of the Army
AR 10-11	U.S. Army Materiel Command
AR 10-13	U.S. Army Communications Command
AR 10-25	U.S. Army Logistics Evaluation Agency
AR 10-38	U.S. Army Concepts Analysis Agency*
AR 10-41	U.S. Army Training and Doctrine Command
AR 10-42	U.S. Army Forces Command
AR 11-4	System Program Reviews
AR 11-8	Principles and Policies of the Army Logistic System
AR 11-13	Army Electromagnetic Compatibility Program
AR 11-14	Logistic Readiness
AR 11-18	Army Programs--The Cost Analysis Program*
AR 11-28	Economic Analysis and Program Evaluation for Resource Management
AR 15-14	Systems Acquisition Review Council Procedures*

AR 18-1	Management Information Systems Policies, Objectives, Procedures, and Responsibilities
AR 34-1	U.S. Participation in NATO Military Standardization, Research and Development, Production and Logistic Support of Military Equipment
AR 37-42	Full Funding of Army Procurement Programs
AR 37-100-XX	The Army Management Structure
AR 70-1	Army Research, Development and Acquisition*
AR 70-2	Materiel Status Recording
AR 70-4	Standardization among Armies of United States, United Kingdom, Canada, Australia
AR 70-6	Management of the Army Research, Development and Acquisition of Materiel
AR 70-8	Personnel Performance and Training Programs (PPTP)*
AR 70-9	Army Research and Development Information System Program Planning and On-going Work Reporting
AR 70-10	Test and Evaluation During Development and Acquisition of Materiel*
AR 70-15	Product Improvement of Materiel
AR 70-16	Department of the Army System Coordinator (DASC) System
AR 70-17	System/Program/Project/Product Management
AR 70-23	The Technical Cooperation Program
AR 70-25	Use of Volunteers as Subjects of Research
AR 70-27	Outline Development Plan/Development Plan/Army Program Memorandum/Defense Program Memorandum/Decision Coordinating Paper*
AR 70-31	Standards of Technical Reporting
AR 70-32	Work Breakdown Structure for Defense Materiel Items
AR 70-33	Mutual Weapons Development Data Exchange Program and Defense Development Exchange Program
AR 70-37	Configuration Management
AR 70-40	U.S. Army Research Offices Overseas
AR 70-41	Cooperation with Allies and Other Nations in Research and Development of Defense Equipment
AR 70-55	Management of U.S. Army Research and Development Center and Laboratories*
AR 71-1	Army Combat Developments*
AR 71-2	Basis of Issue Plans*
AR 71-3	User Testing (Force Development User Testing)*
AR 71-6	Type Classification/Reclassification of Army Materiel
AR 71-7	Military Training Aids and the Army Training Aids Center System*
AR 71-8	Army Programs for Test and Evaluation
AR 71-9	Materiel Objectives and Requirements*
AR 71-10	Test and Evaluation during Development and Acquisition of Materiel
AR 108-2	Army Training and Audio-Visual Support
AR 135-205	Army National Guard and Army Reserve Enlisted Personnel Management
AR 310-2	Identification and Distribution of DA Publications and Issue of Agency and Command Administrative Publications

AR 310-3	Preparation, Coordination and Approval of DA Publications
AR 310-25	Dictionary of U.S. Army Terms (Short Title: AD)
AR 310-31	Management System for Tables of Organization and Equipment (The TOE System)*
AR 310-34	Equipment Authorization Policies and Criteria and Common Tables of Allowance*
AR 310-49	The Army Authorization Documents System (TAADS)*
AR 350-1	Army Training
AR 350-2	Opposing Force (OPFOR) Program
AR 350-XXX	New Equipment Training and Introduction (Supersedes AR 71-5)*
AR 351-1	Individual Military Education and Training
AR 351-20	Army Correspondence Course Program
AR 381-11	Threat Analysis
AR 381-19	Intelligence Support
AR 381-143	Logistic Policies and Procedures (U)
AR 385-10	Army Safety Program
AR 385-16	System Safety
AR 385-62	Fixing Guided Missiles and Heavy Rockets for Training, Target Practice, and Combat
AR 385-63	Regulations for Firing Ammunition for Training, Target Practice, and Combat
AR 415-15	Military Construction Army (MCA) Program Development
AR 415-28	Department of the Army Facility Classes and Construction Categories
AR 570-2	Organization and Equipment Authorization Tables--Personnel*
AR 570-3	Manpower Utilization and Requirements
AR 570-4	Manpower Management
AR 600-200	Enlisted Personnel Management
AR 602-1	Human Factors Engineering Program*
AR 611-1	Military Occupational Classification Structure, Development and Implementation*
AR 611-3	Military Occupational Data Bank (MODB)
AR 611-101	Commissioned Officer Specialty Classification System
AR 611-112	Manual of Warrant Officer Military Occupational Specialties
AR 611-201	Enlisted Career Management Fields and Military Occupational Specialties
AR 623-1	Academic Evaluation Reports
AR 700-4	Logistics Assistance Program
AR 700-18	Provisioning of U.S. Army Equipment
AR 700-47	Defense Standardization Program
AR 700-51	Army Data Management Program
AR 700-78	Production and Post-Production Testing of Army Materiel
AR 700-127	Integrated Logistic Support*
AR 702-3	Army Materiel Reliability, Availability, and Maintainability (RAM)
AR 708-1	Cataloging and Supply Management Data
AR 715-6	Proposal Evaluation and Source Selection
AR 750-1	Army Materiel Maintenance Concepts and Policies
AR 1000-1	Basic Policies for System Acquisition by the Department of the Army*
AR 1000-2	Operating Policies for System Acquisition by the Department of the Army

TRADOC Regulations

10-4	Mission Assignments
10-5	Headquarters, U.S. Army Training and Doctrine Command
11-5	Cost Analysis Program (MOS Training Costs)
11-8	Cost and Operational Effectiveness Analysis*
11-9	TRADOC Development and Acquisition Priorities
70-1	Research and Development, New Equipment Training Requirements and Procedures
71-1	U.S. Army Training and Doctrine Command (TRADOC) Management Information System (TRAMIS)
71-3	Acceptance and Assignment of New Combat Development Tasks
71-4	TRADOC Standard Scenarios
71-5	Scenario Oriented Recurring Evaluation Systems (SCORES)
71-9	User Testing
71-12	Total Systems Management--TRADOC System Manager*
71-17	Force Development Unit Reference Sheet
310-2	ARTEP, Preparation of Army Training and Evaluation Program
350-2	Development, Implementation, and Evaluation of Individual Training*
350-100-1	System Engineering of Training (Course Design)
351-3	Resident Training Policy*
351-4	Job and Task Analysis
351-5	Designation of Military Occupational Specialties (MOS)/ Additional Skill Identifier (ASI) Proponency
600-4	Integrated Personnel Support (IPS)*
700-1	Integrated Logistic Support*
702-1	Product Assurance Combat Development Program for Reliability, Availability, and Maintainability (RAM)

DARCOM/AMC Regulations

DARCOM-R 1-35	Orientation of Newly Assigned Project Managers
AMCR 10-1	Organization Control, Concepts, Policies, Responsibilities and Documentation
DARCOM-R 11-1	Systems Analysis
AMCR 11-4	AMC Resource Management Systems Concepts, Principles, and Responsibilities
AMCR 11-12	Logistics Priorities
DARCOM-R 11-19	Materiel Development and Acquisition Technical Milestone Progress Report
DARCOM-R 11-27	Life Cycle Management of DARCOM Materiel*
DARCOM-R 70-1	Transition of Management Responsibility from a Research and Development Command Manager to a Materiel Readiness Command Manager
AMCR 70-5	Research and Development Program Reviews for Milestone Decisions during Materiel Acquisition
DARCOM-R 70-30	Concept Formulation: Prerequisites to Initiating Engineering or Operational Systems Development Effort
AMCR 70-46	Technical Data Package for Procurement and Production of AMC Materiel

DARCOM-R 70-50	Validation Prototyping
DARCOM-R 70-52	System Engineering
AMCR 70-60	Materiel Status Office
AMCR 350-6	New or Modified Equipment and Materiel
AMCR 385-12	Life Cycle Verification of Materiel Safety
AMCR 385-100	AMC Safety Manual
DARCOM-R 700-5	Major Item Management
AMCR 700-6	AMC Quality Assurance System
DARCOM-R 700-13	Integrated Logistic Support Performance Evaluation Report (ILSPER)
AMCR 700-34	Release of Materiel for Issue
AMCR 700-38	Test and Evaluation--Incidents Disclosed during Materiel Testing
AMCR 700-66	Staff Responsibility for Logistic Item Data Elements
AMCR 700-97	Standard Integrated Support Management System
DARCOM Supplement #1 to AR 700-127	Integrated Logistic Support*
DARCOM-R 702-9	System Assessment Program
DARCOM-R 750-27	AMC Life Cycle Management and Use of Logistic Technical Data

DA Circular

DA Circular 310-87 Soldier's Manual (Field Manuals)

TRADOC Circulars

TRADOC Circular 25-2	Army Range Requirements (Draft)
TRADOC Circular 70-80-1	Training Device Development*
TRADOC Circular 108-1	Training Aids Support Center (TASC) Training
TRADOC Circular 310-5	Preparation of Army-wide Training Literature
TRADOC Circular 350-2	Officer Job/Task Analysis and Training Development
TRADOC Circular 350-3	Individual/Collective Training and Development
	Glossary (TBP)*
TRADOC Circular 351-1	Common Job and Task Management
TRADOC Circular 351-2	Army Correspondence Course Program Subcourses
TRADOC Circular 351-3	Individual Training Plan (TBP)*
TRADOC Circular 351-4	Job and Task Analysis (TBP)*
TRADOC Circular 351-5	SQT Policy and Procedures*
TRADOC Circular 351-6	Readability of Training Materials
TRADOC Circular 351-7	Job Training Package
TRADOC Circular 351-8	Individual and Collective Training Plans for Developing Systems: Policies and Procedures*
TRADOC Circular 351-28	Soldier's Manuals, Commander's Manuals, and Job Books-Policy and Procedures
TRADOC Circular 351-XXX	Collective Training Plan

TRADOC Training Circulars

TRADOC TC 21-5-3	Training Extension Course Management Instructions
TRADOC TC 21-5-7	Training Management in Battalions

DA Pamphlets

DA Pamphlet 5-5	Guidance for Study Sponsors and Study Advisory Groups
DA Pamphlet 11-2	Research and Development Cost Guide for Army
DA Pamphlet 11-3	Investment Cost Guide for Army Materiel Systems
DA Pamphlet 11-4	Operating and Support Cost Guide for Army Material Systems
DA Pamphlet 11-5	Standards for Presentation and Documentation of Life Cycle Cost Estimates for Materiel Systems
DA Pamphlet 11-25	Life Cycle System Management Model for Army Systems*
DA Pamphlet 70-21	The Coordinated Test Program (CTP)
DA Pamphlet 310-12	Index and Description of Army Training Devices
DA Pamphlet 350-37	SQT Handbook
DA Pamphlet 350-XXX	SQT--A Guide for Leaders (Draft)
DA Pamphlet 570-558	Staffing Guide for U.S. Army Service Schools
DA Pamphlet 700-XXX	Integrated Logistic Support (ILS)
DA Pamphlet 701-1	Army Logistic System Master Plan (LOGMAP): Executive Summary
DA Pamphlet 705-1	Research and Development of Materiel:
	Maintainability Engineering
DA Pamphlet 750-26	Logistic Support Modeling

TRADOC Pamphlets

TRADOC Pamphlet 5-5	Guidance for Study Sponsors and Study Advisory Groups
TRADOC Pamphlet 11-2	Research and Development Cost Guide for Army
TRADOC Pamphlet 11-8	Cost and Operational Effectiveness Analysis*
TRADOC Pamphlet 11-10	Guide for Preparation and Conduct of System Program Review
TRADOC Pamphlet 11-11	TRADOC Resources Management System
TRADOC Pamphlet 11-28	Economic Analysis and Program Evaluation for Resource Management
TRADOC Pamphlet 70-2	Human Resources Research and Development
TRADOC Pamphlet 71-3	Combat Developments Study Writing Guide
TRADOC Pamphlet 71-8	Analyzing Training Effectiveness*
TRADOC Pamphlet 71-9	Catalog of TASO Training Devices
TRADOC Pamphlet 71-10	Cost and Training Effectiveness Analysis Handbook*
TRADOC Pamphlet 71-11	Scenario and SCORES Process
TRADOC Pamphlet 71-12	Combat Developments Staff Officer's Handbook
TRADOC Pamphlet 350-30	Interservice Procedures for Instructional System Development (Five Volumes)*
TRADOC Pamphlet 351-4	Job and Task Analysis Handbook

DARCOM/AMC Pamphlets

DARCOM-P 70-3	Validation Prototype
DARCOM-P 70-4	Software Acquisition--A Guide for the Materiel Developer
DARCOM-P 700-6	Life Cycle Cost as a Design Parameter
DARCOM-P 700-9-1	Guide for Integrated Logistic Support During the Conceptual Phase*
AMCP 706-191	System Analysis and Cost Effectiveness
AMCP 750-16	Maintenance of Supplies and Equipment: AMC Guide to Logistic Support Analysis

DA Field Manuals

FM 21-1 (Test)	Soldier's Manual of Common Tasks
FM 21-6	How to Prepare and Conduct Military Training
FM 21-11	First Aid for Soldiers (Field Manual)

DA Technical Manuals

TM 38-703	Integrated Logistic Support (ILS): Management Guide
TM 38-703-1	Integrated Logistic Support (ILS): Management Integration
TM 38-703-2	Integrated Logistic Support (ILS): Procedural Guide
TM 38-703-3	Integrated Logistic Support (ILS): Maintenance Engineering Analysis Data System
TM 38-703-4	Integrated Logistic Support (ILS): Contractual Techniques
TM 38-710	Integrated Logistic Support: Implementation Guide for DOD Systems and Equipment
TM 38-750	The Army Maintenance Management System
TM 38-760-1	A Guide to System Engineering

Military Standards

MIL-STD 109	Quality Assurance Terms and Definitions
MIL-STD 490	Military Standard Specification Practices
MIL-STD 721B	Definitions of Effectiveness Terms for Reliability, Availability, Maintainability, Human Factors, and Safety
MIL-STD 881A	Work Breakdown Structure for Defense Materiel Items
MIL-STD 1388-1	Logistic Support Analysis
MIL-STD 1388-2	Logistic Support Analysis Data Element Definitions
MIL-STD 1427-B	Human Engineering Design Criteria for Military Systems, Equipment, and Facilities
MIL-M-38784 (TM)	Manuals, Technical: General Requirements for Preparation of
MIL-M-63035 (TM)	Manuals, Technical: Front-End Analysis
MIL-M-63036 (TM)	Manuals, Technical: Preparation of Operator's
MIL-M-63037 (TM)	Manuals, Technical: Organization, Direct Support and General Support Maintenance (ITDT Flowchart)
MIL-M-63038 (TM)	Manuals, Technical: Organizational, Direct Support and General Support Maintenance
MIL-M-63040	Extension Training Material
MIL-HDBK-63038-1 (TM)	Manuals, Technical: Technical Writing Handbook
MIL-HDBK-63038-2 (TM)	Manuals, Technical: Technical Writing Style Guide

Other Military Documents

DARCOM/TRADOC	Materiel Acquisition Handbook, 1 November 1975*
DARCOM/TRADOC/ITDT (SPA)	Policy Statement
DARCOM/TRADOC	Technical Documentation and Training Acquisition Handbook (Joint PM/ARTADS/TRADE Workbook) (Draft 1977)*

DODI 4100.35-G

OTEA

TD-3

LCC-3

USATSC

Integrated Logistics Support Planning Guide for DOD
Systems and Equipment, October 1968

Operational Test and Evaluation Methodology Guide*

DOD Index of Data Item Descriptions

DOD Life Cycle Costing Guide for System Acquisitions
(Interim), January 1973

Learning Development Study: A Guide to Training
Effectiveness Analysis for Training Devices

APPENDIX C

PART 2 - SELECTED TECHNICAL REFERENCES

The documents listed in this section collectively discuss most of the technical activities that must be accomplished by the training proponent for a major system. These documents seldom discuss detailed procedures. However, many of them review one or more strategies for accomplishing a training-related action and the factors to consider when implementing a particular strategy. The documents have been grouped according to the following categories:

- A. Human Resources vs. Materiel Design Trade-Offs
- B. Estimation of Requirements
 - 1. Personnel
 - 2. Logistics
 - 3. Training
 - 4. Training Devices
- C. Computation of Costs
- D. Cost-Effectiveness Analysis
- E. Operational Test and Evaluation (OT&E)
- F. Job and Task Analysis
- G. Instructional System Development (ISD) Techniques
- H. Preparation of Job and Performance Aids and SPAS Material
- I. TSM Handbooks

A. Human Resources vs. Materiel Design Trade-Offs

Askren, W. B., Human Resources and Personnel Cost Data in System Design Trade-Offs. AFHRL-TR-73-46, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, October 1973.

Askren, W. B. and Korkan, K. D., Design Option Decision Trees: A Method for Relating Human Resources Data to Design Alternatives. AFHRL-TR-71-52, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, December 1971.

Askren, W. B. and Korkan, K. D., Design Option Decision Trees: A Method for Systematic Analysis of Design Problems and Integration of Human Factors Data. AFHRL-TR-75-9, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, and Proceedings of the Human Factors Society, October 1974.

Askren, W. B., Korkan, K. D. and Watts, G. W., Human Resources Sensitivity to System Design Trade-Off Alternatives. AFHRL-TR-73-21, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, November 1973.

Chaillet, R. F., Human Factors Engineering Requirements for the Development of U. S. Army Material. Human Engineering Laboratories, Aberdeen Proving Grounds, MD, January 1965.

Cream, B. W., Eggemeier, F. T. and Klein, G. A., Behavioral Data in the Design of Aircrew Training Devices. Proceedings of the Human Factors Society, 1975.

Eckstrand, G. A., Askren, W. B. and Snyder, M. T., Human Resources Engineering: A New Challenge. Human Factors, Vol. 9, No. 6, 1967, pp. 517-520.

Fitts, P. M. et al. (Eds.). Human Engineering for an Effective Air Transportation and Traffic Control System, National Research Council, Washington, D.C., 1951.

Goclowski, J. C., Askren, W. B., King, G. F. and Ronco, P. G. Integration and Application of Human Resource Technologies in Weapon System Design: Processes for the Coordinated Application of Five Human Resource Technologies. AFHRL-TR-78-6(II), USAF Human Resources Laboratory, Brooks AFB, TX, October 1977.

Goclowski, J. C., King, G. F., Ronco, P. G. and Askren, W. B., Integration and Application of Human Resource Technologies in Weapon System Design: Coordination of Five Human Resource Technologies. AFHRL-TR-78-6(I), USAF Human Resources Laboratory, Brooks AFB, TX, March 1978.

Goclowski, J. C., King, G. F., Ronco, P. G. and Askren, W. B., The Integration and Application of Human Resource Technologies in Weapon System Design: Consolidated Data Base Functional Specification. AFHRL-TR-78-6(III), USAF Human Resources Laboratory, Brooks, AFB, TX, May 1978.

Korkan, K. D., Askren, W. B. and Watts, G. W., Human Resources Sensitivity to System Design Trade-Off Alternatives: Feasibility Test with Jet Engine Data. AFHRL, TR-73-21, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, November 1973.

Lintz, L. M., Askren, W. B. and Lott, W. J., System Design Trade Studies: The Engineering Process and Use of Human Resources Data. AFHRL-TR-71-24, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, June 1971 and Human Factors, February 1975.

Meister, D., Human Factors: Theory and Practice. John Wiley & Sons, Inc. 1973.

Van Cott, H. P. and Kinkade, R. G. (Eds.), Human Engineering Guide to Equipment Design. American Institute for Research, Washington, D.C., 1972.

Whalen, G. V. and Askren, W. B. Impact of Design Trade Studies on System Human Resources. AFHRL-TR-74-89, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, December 1974.

B. Estimation of Requirements

1. Personnel

Maher, F. A. and York, M. L., Simulating Maintenance Manning for New Weapon Systems: Maintenance Manpower Management during Weapons System Development. AFHRL-TR-74-97(I), USAF Human Resources Laboratory, Wright-Patterson AFB, OH, December 1974.

Moody, W. D., Nichols, S. R. and Tetmeyer, D. C., Manpower Program. AFHRL-TR-74-97(V), USAF Human Resources Laboratory, Wright-Patterson AFB, OH, 1975.

Tetmeyer, D. C., Estimating and Controlling Manpower Requirements for New Systems: A Concept and Approach, AFHRL-TR-74-31, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, April 1974.

2. Logistics

Drake, W. F., et al, Logistics Composite Model Users Reference Guide. USAF Logistics Command Report 70-1, Headquarters Air Force Logistics' Command, January 1970.

Nichols, S. R., Deem, R. N. and Tetmeyer, D. C., Maintenance Data Analysis Programs. AFHRL-TR-74-97(III). USAF Human Resources Laboratory, Wright-Patterson AFB, OH, 1975.

3. Training

Branch, K. V., Duffy, L. R., Staley, J. D. and Yanko, R. E. Design of Training Systems, Phase IV Report. IBM Corporation, Cape Canaveral, FL, October 1976.

4. Training Devices

Caro, P. W., Hall, E. R. and Brown, G. E., Jr., Design and Procurement for Coast Guard Aircraft Simulators. HumRRO-TR-69-103, Human Resources Research Organization, Alexandria, VA, December 1969.

King, W. J. and Duva, J. S. (Eds.), New Concepts in Maintenance Trainers and Performing Aids. NAVTRAEQUIPCEN IH-255, Navel Training Equipment Center, Orlando, FL, April 1975.

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C. Computation of Costs

Air Force Test and Evaluation Center. Cost of Ownership Handbook, Kirtland Air Force Base, NM.

Anthony, B. H., USAF Military Personnel Costing Problems and Approaches. AFHRL-TR-77-39, USAF Human Resources Laboratory, August 1977.

Baran, H. A., Air Force Human Resources Laboratory Military Personnel Costing Conference. AFHRL-TR-74-106, USAF Human Resources Laboratory, Wright-Patterson AFB, OH, December 1974.

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Gay, R. M., Estimating the Cost of On-the-Job Training in Military Occupations: A Methodology and Pilot Study. Defense Advance Research Projects Agency, April 1974.

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D. Cost-Effectiveness Analysis

Cost and Training Effectiveness Analysis (CTEA) of the CH-47 Flight Simulator (CH47FS). Study Plan, U. S. Army Aviation Center, Fort Rucker, AL, December 1976.

Gay, R. M. and Nelson, G. R., Cost and Efficiency in Military Specialty Training. The Rand Corporation, January 1974.

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E. Operational Test and Evaluation (OT&E)

Galloway, R. T., Maximizing Flight Fidelity: Integration of Naval Air Test Center Capabilities into the Procurement of Major Aviation Training Devices. Naval Air Test Center, Patuxent River, MD and Naval Training Equipment Center Industry Conference (9th), Orlando, FL, November 1976.

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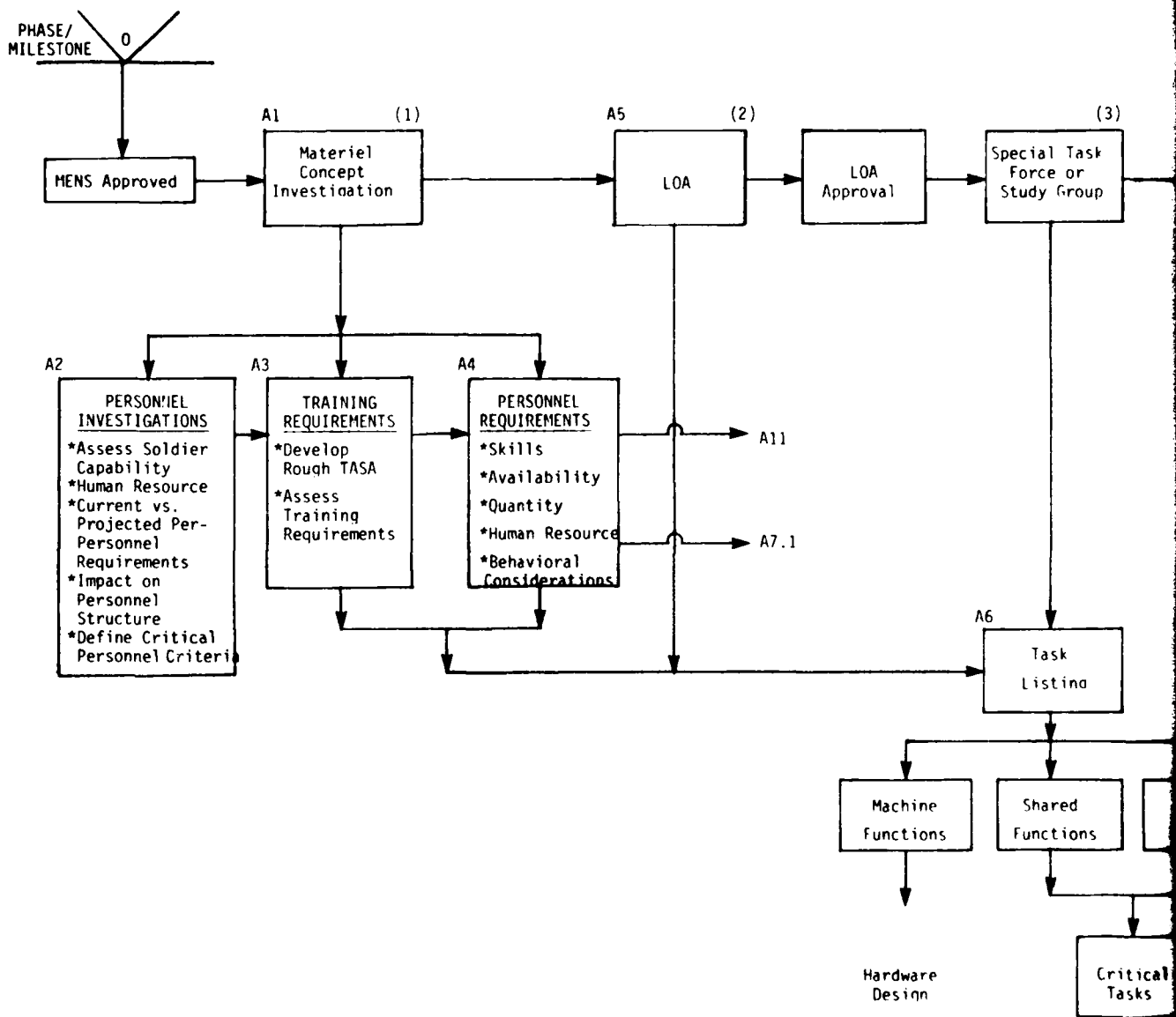
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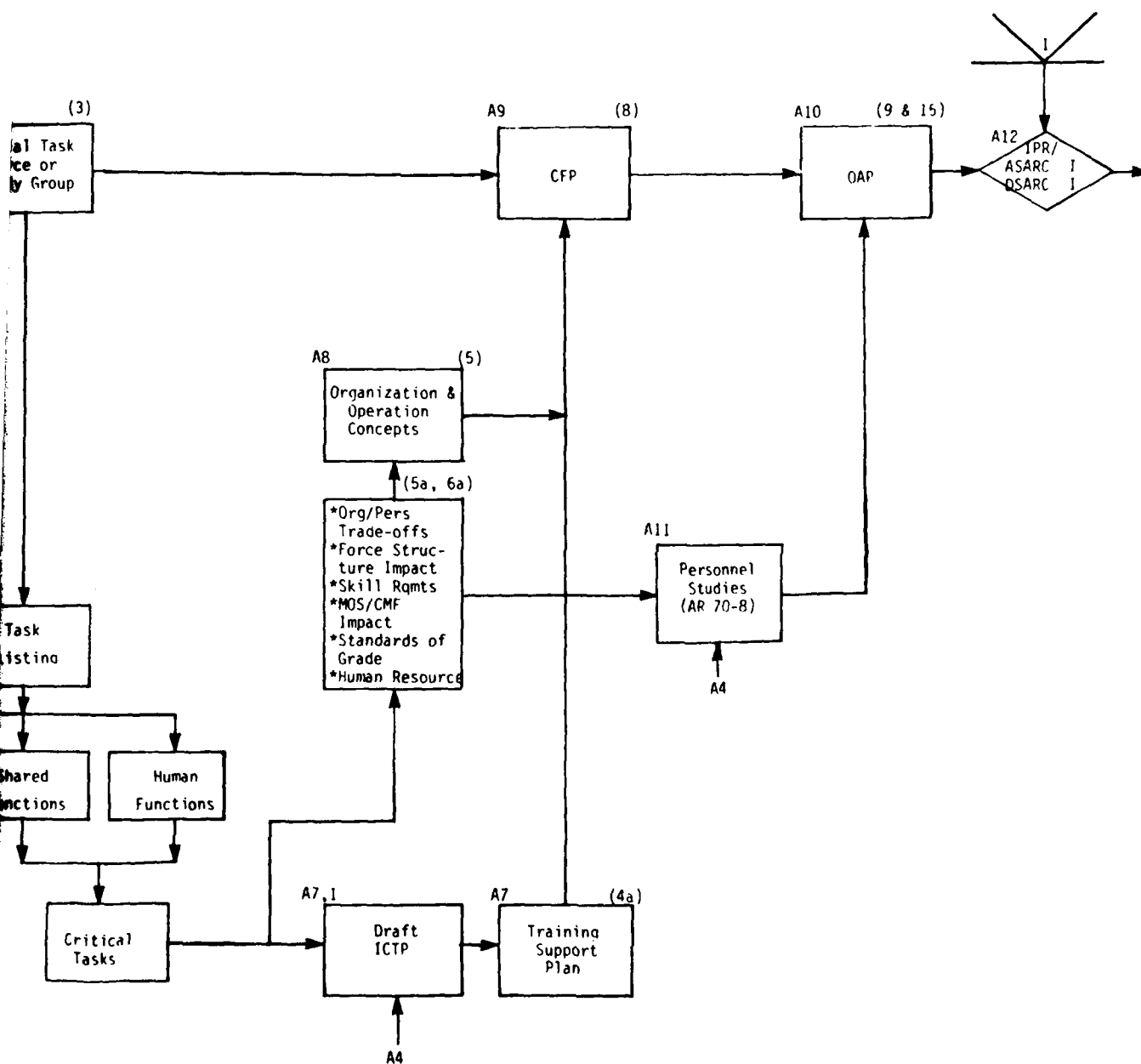
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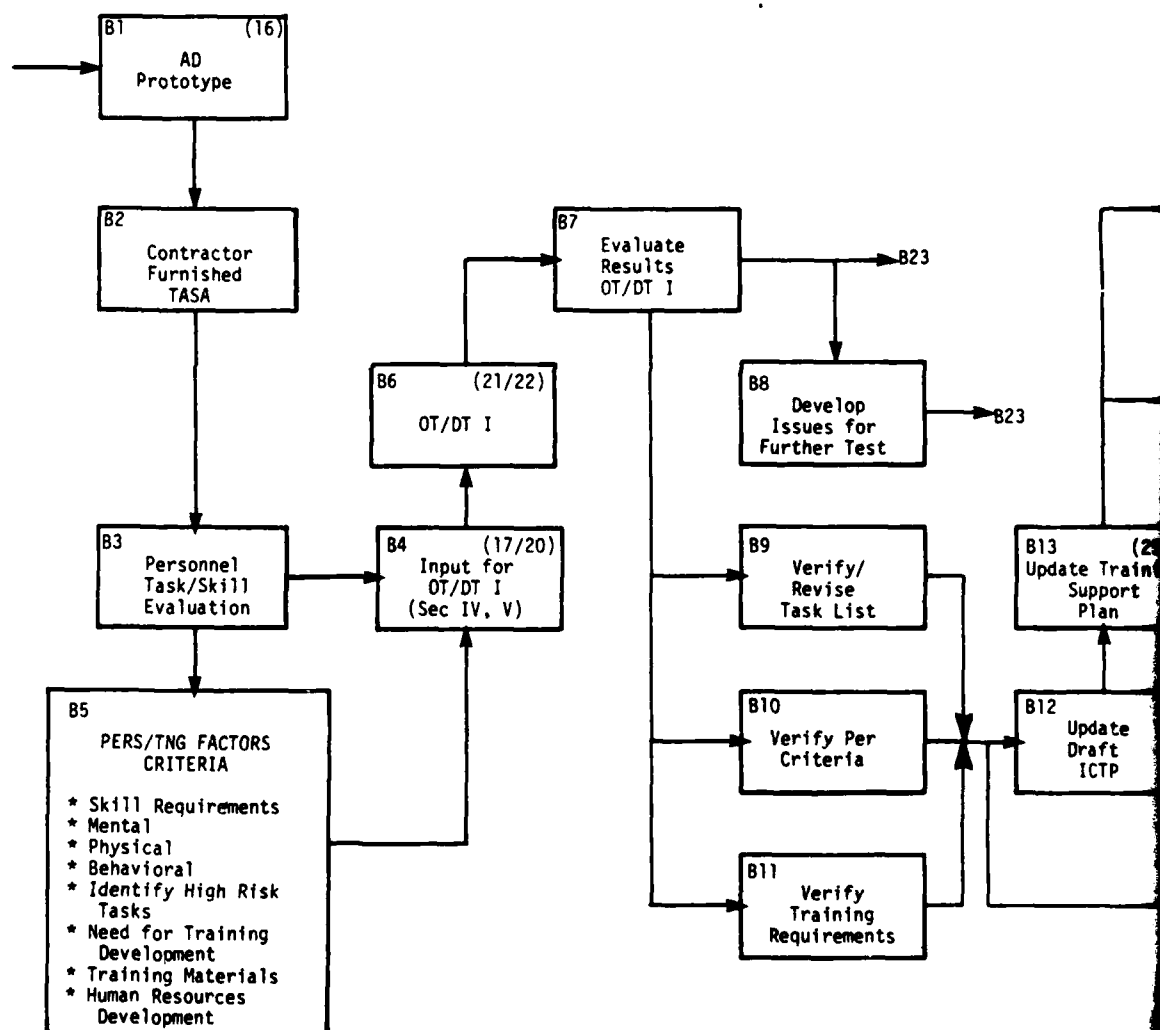


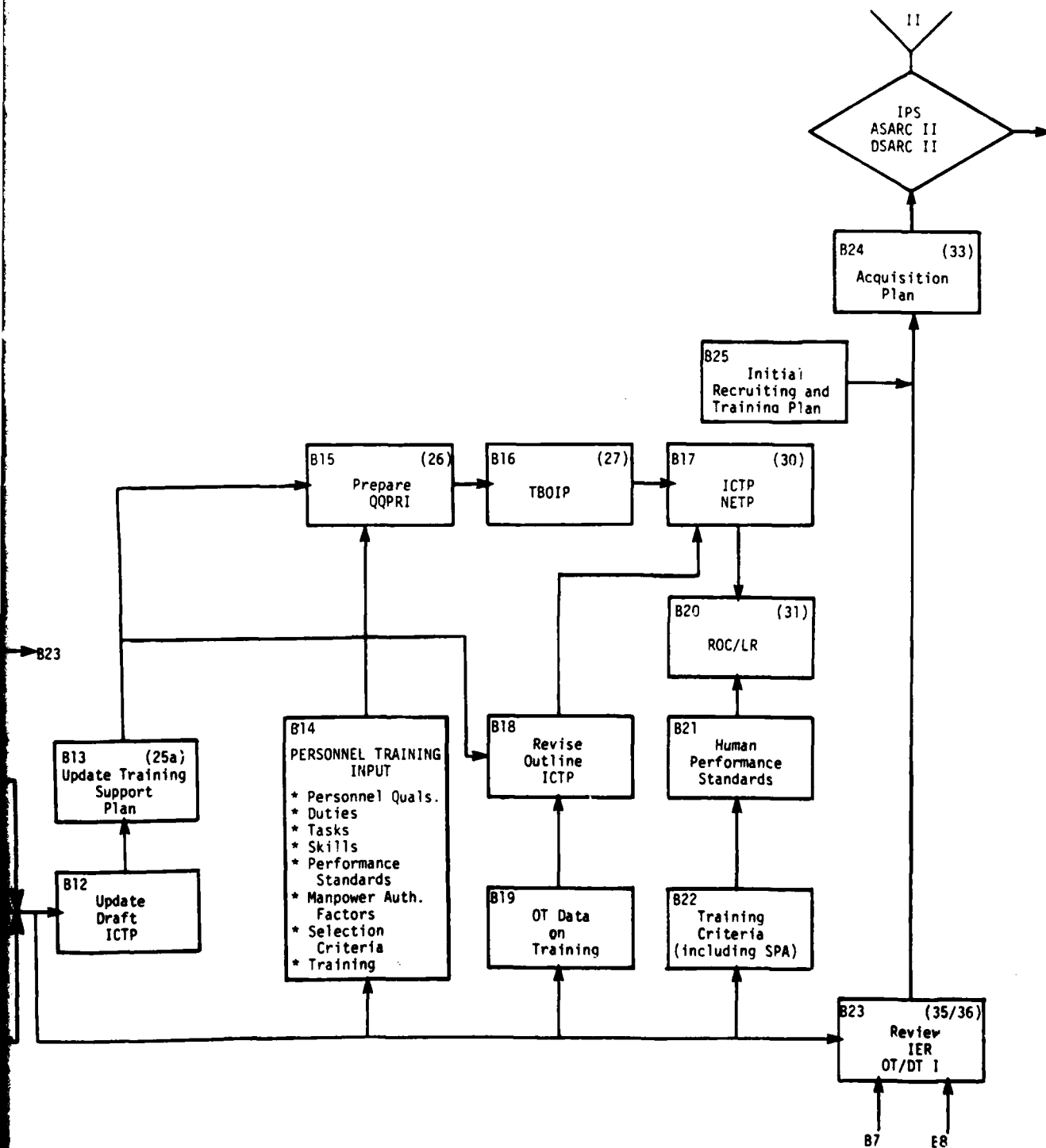


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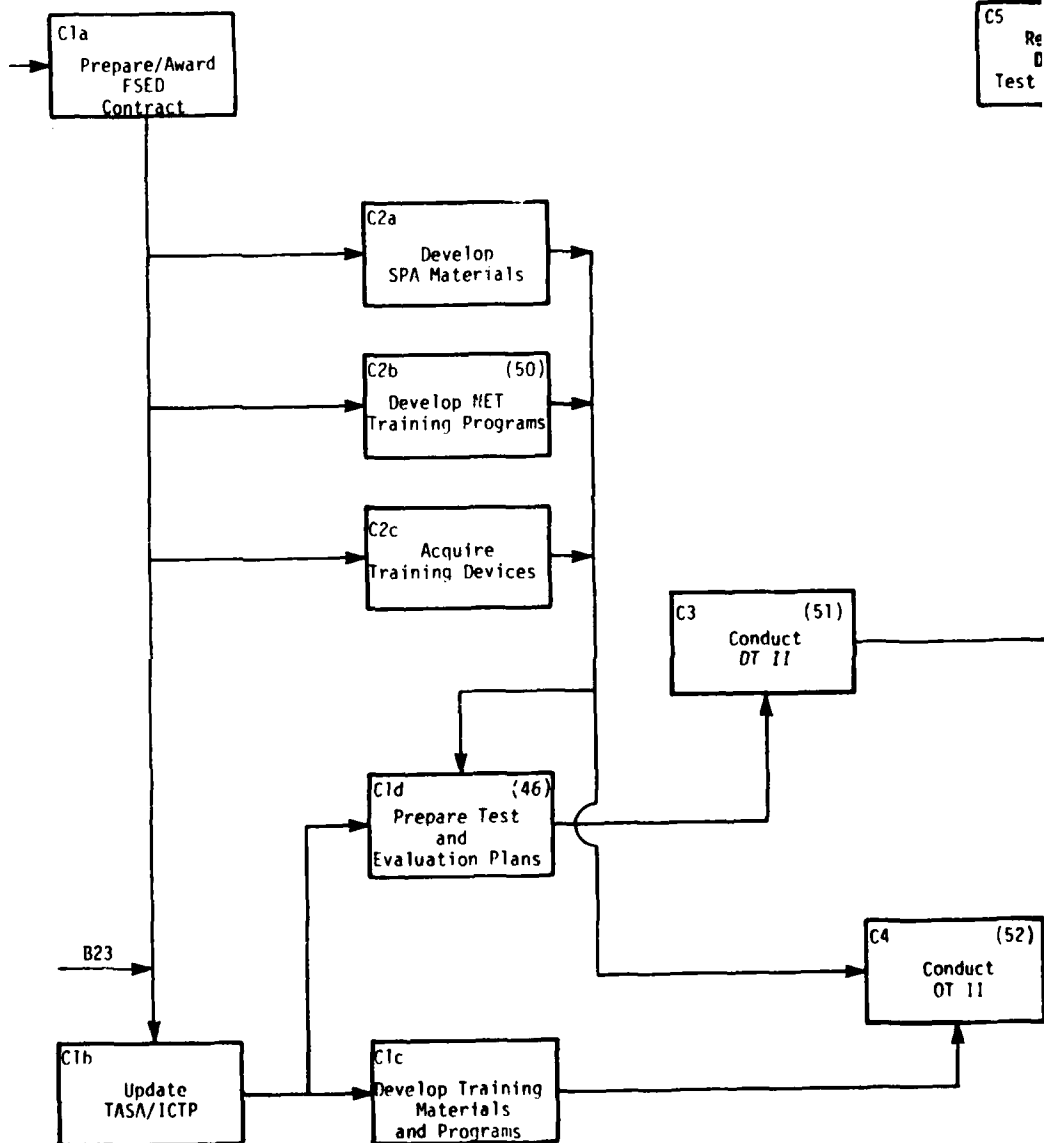




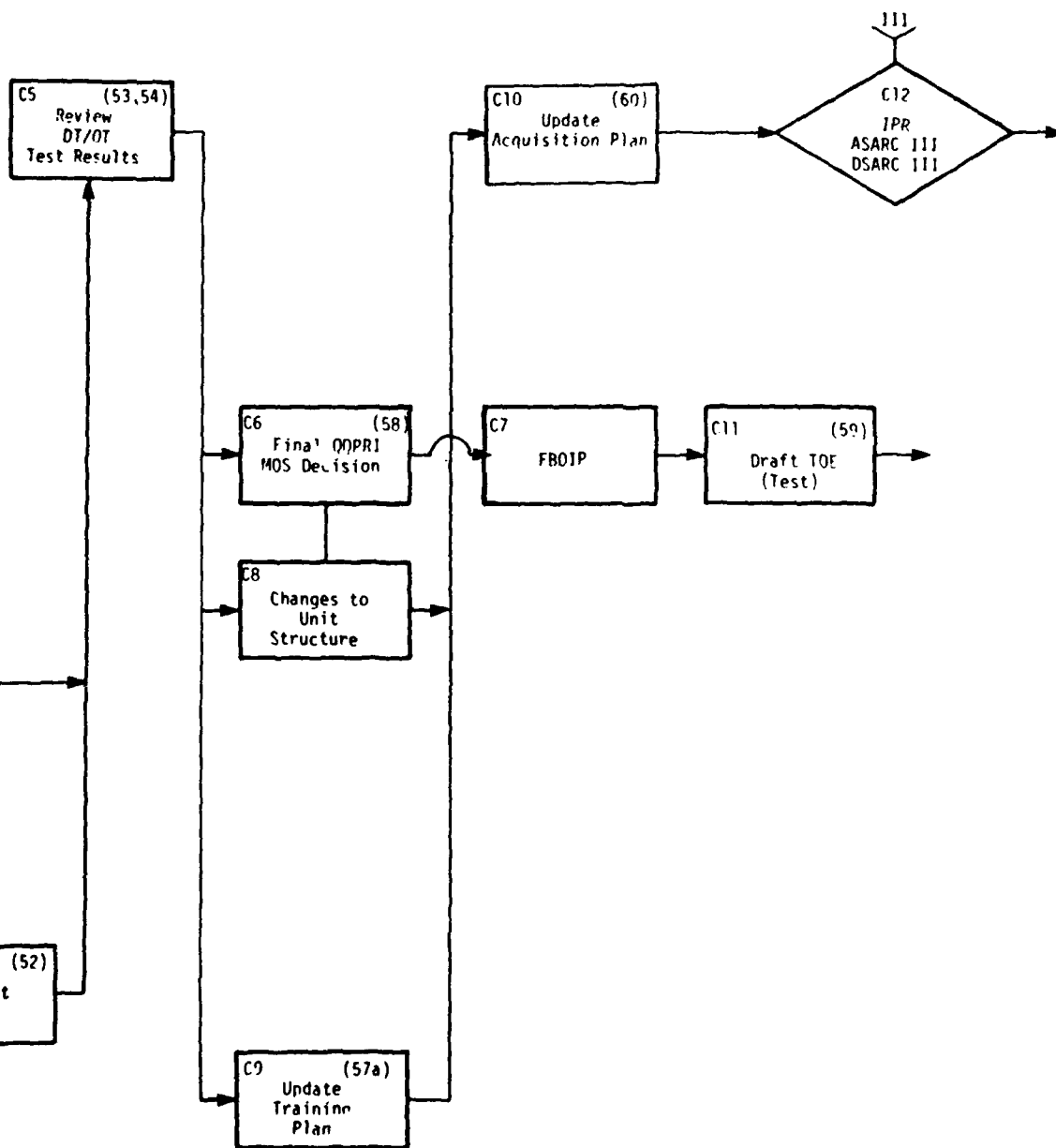
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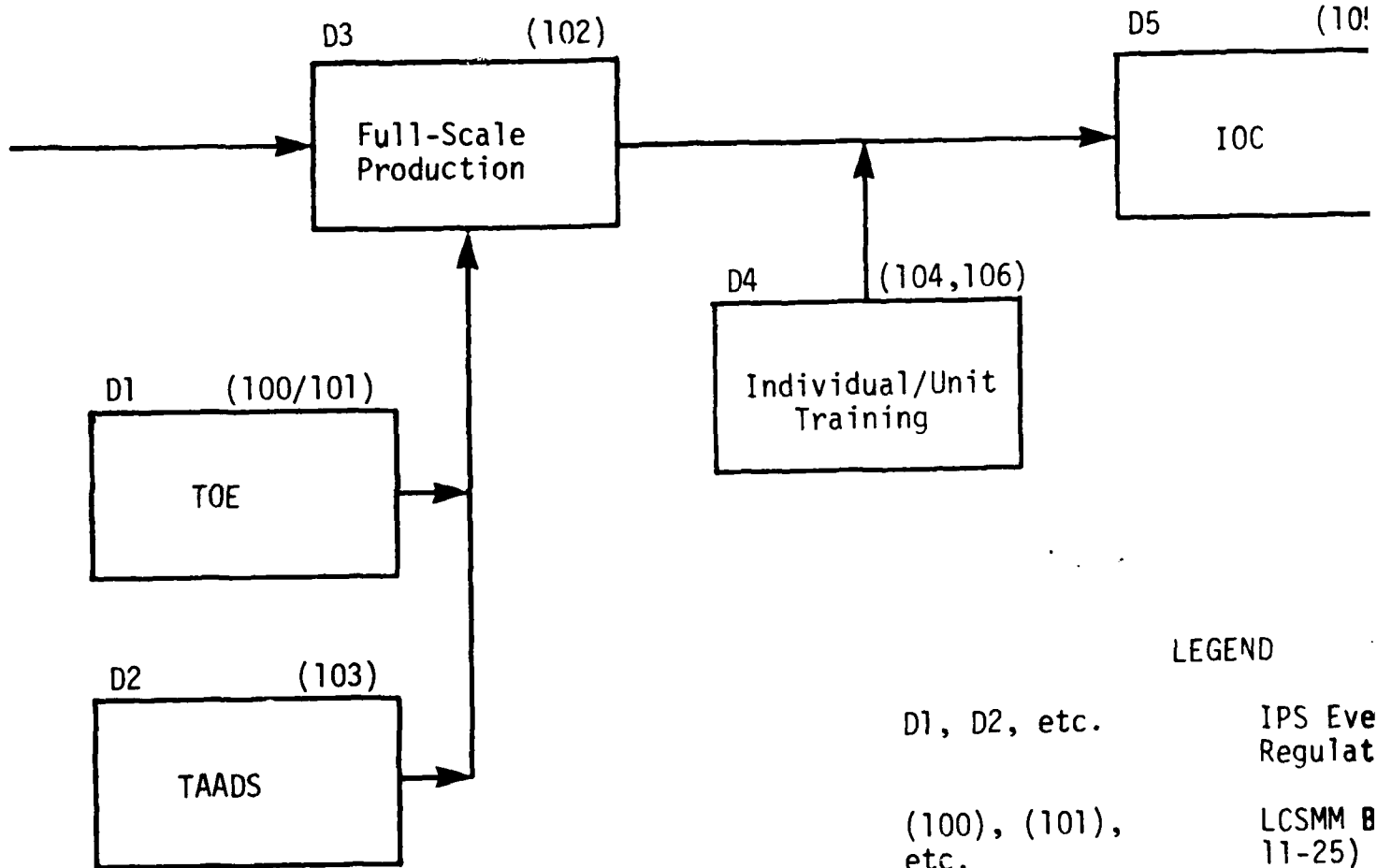


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